

THE IRON AGE

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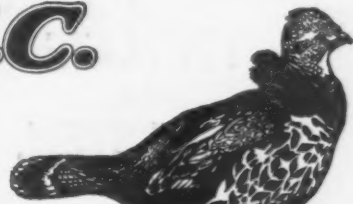
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Ad. on Page 16

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See page 57

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THE IRON AGE

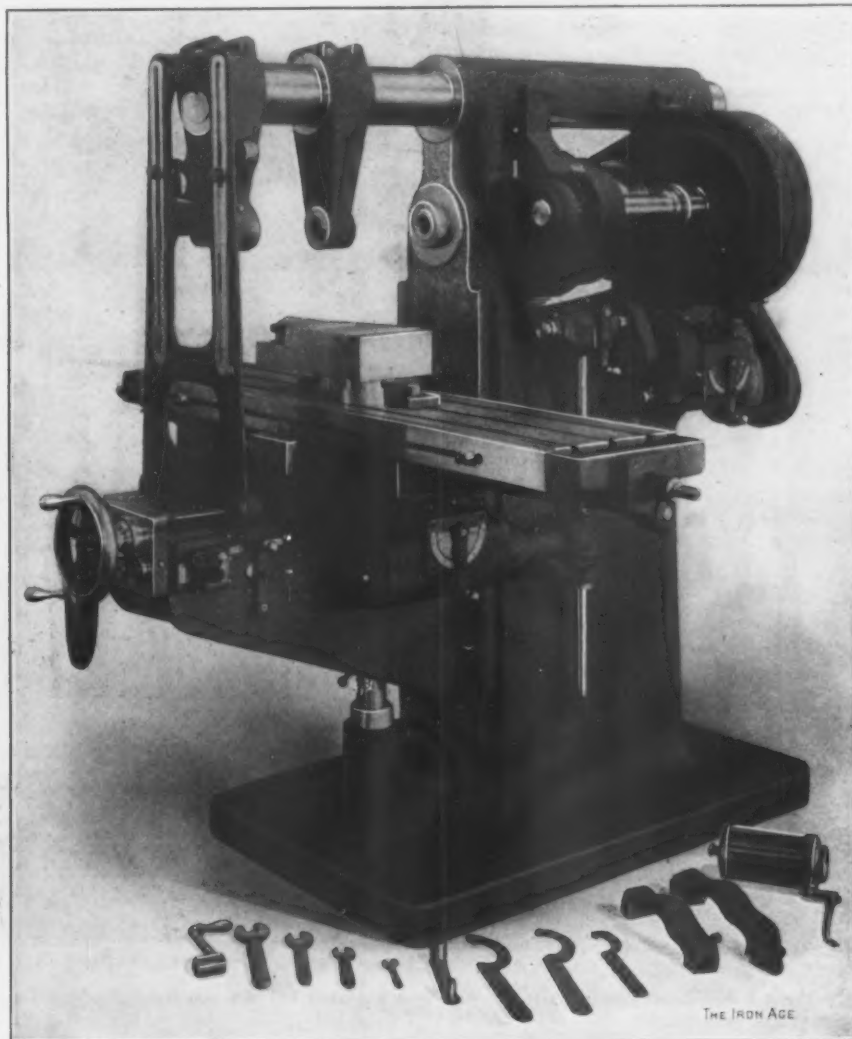
New York, Thursday, March 28, 1907.

New Owen Milling Machines.

Two new sizes of plain milling machines, known as Nos. 2-B and 3-B, respectively, have recently been put on the market by the Owen Machine Tool Company, Springfield, Ohio. The illustration herewith is of the 3-B machine, which differs from the 2-B very slightly, except in its dimensions and the range of work it is adapted to handle. Both machines are provided with 32 changes of feed, any of which may be obtained with impunity while the machine is in motion. The table has double bearing surfaces, which allow it to work freely, even when it is at either extreme of its travel, and also

The 3-B machine is provided with double back gears in the drive, giving ratios of 3 to 1 and 10 to 1, respectively. In all 18 changes of speed are possible. A single back gear on the No. 2 machine, having a ratio of 6 to 1, gives that machine eight changes of speed. The overhanging arm is of solid steel, and the arbor supports are equipped with bronze bushes. The arbors on both machines are of forged crucible steel and are 1 in. in diameter, that on the 3-B being 14 in. long and on the 2-B 11 in. long from the shoulder to the nut.

The No. 3-B plain milling machine, the one illustrated, has a longitudinal movement of 38 in., traverse movement of 11 in. and vertical movement of 20 $\frac{1}{4}$ in.



The No. 3-B Plain Milling Machine Built by the Owen Machine Tool Company, Springfield, Ohio.

assist in maintaining perfect alignment. Steel gears are used throughout the machines. These are, in brief, the features of the machines on which special emphasis is laid.

The feeds are positive gear driven and are automatic. All of the changes are in easy reach of the operator. The spindle is of crucible steel, and runs in phosphor bronze boxes. The front end is threaded, and means are provided in the bearings to compensate for wear. The table has three T-slots $\frac{5}{8}$ -in. wide and is adapted to hold a vise of swivel pattern having a graduated base, so that it can be set quickly at any angle. A No. 3 vise is used on the 3-B machine, which has jaws 7 $\frac{1}{4}$ in. wide, 1 $\frac{1}{2}$ in. deep and opens to a width of 4 $\frac{1}{2}$ in. The No. 2 vise used on the 2-B machine has jaws 6 $\frac{1}{4}$ in. wide, 1 $\frac{1}{2}$ in. deep and opens to 3 $\frac{1}{4}$ in.

The table is 12 $\frac{1}{2}$ x 56 in. and has a working surface of the same width, 50 in. long. The overhanging arm is 4 $\frac{1}{2}$ in. in diameter. The diametrical swing around the spindle center is 15 $\frac{1}{2}$ in., and the spindle has a No. 11 B. & S. taper hole, with an 11-16-in. hole through. The 32 changes of speed range from 0.003 to 0.3 in. per revolution of the spindle. The machine occupies a floor space of 97 in. in line with the spindle by 104 in. transversely thereto, when permitting the extreme limits of the table movement, and weighs complete 4300 lb.

The No. 2-B plain milling machine has the following dimensions: longitudinal movement, 28 in.; traverse movement, 7 $\frac{1}{2}$ in.; vertical movement, 19 $\frac{1}{2}$ in.; the table is 44 $\frac{1}{4}$ x 10 in., and has a working surface of the same width, 41 $\frac{1}{4}$ in. long; the overhanging arm is 4 in. in diameter, and the spindle has a diametrical swing of 12 $\frac{1}{2}$

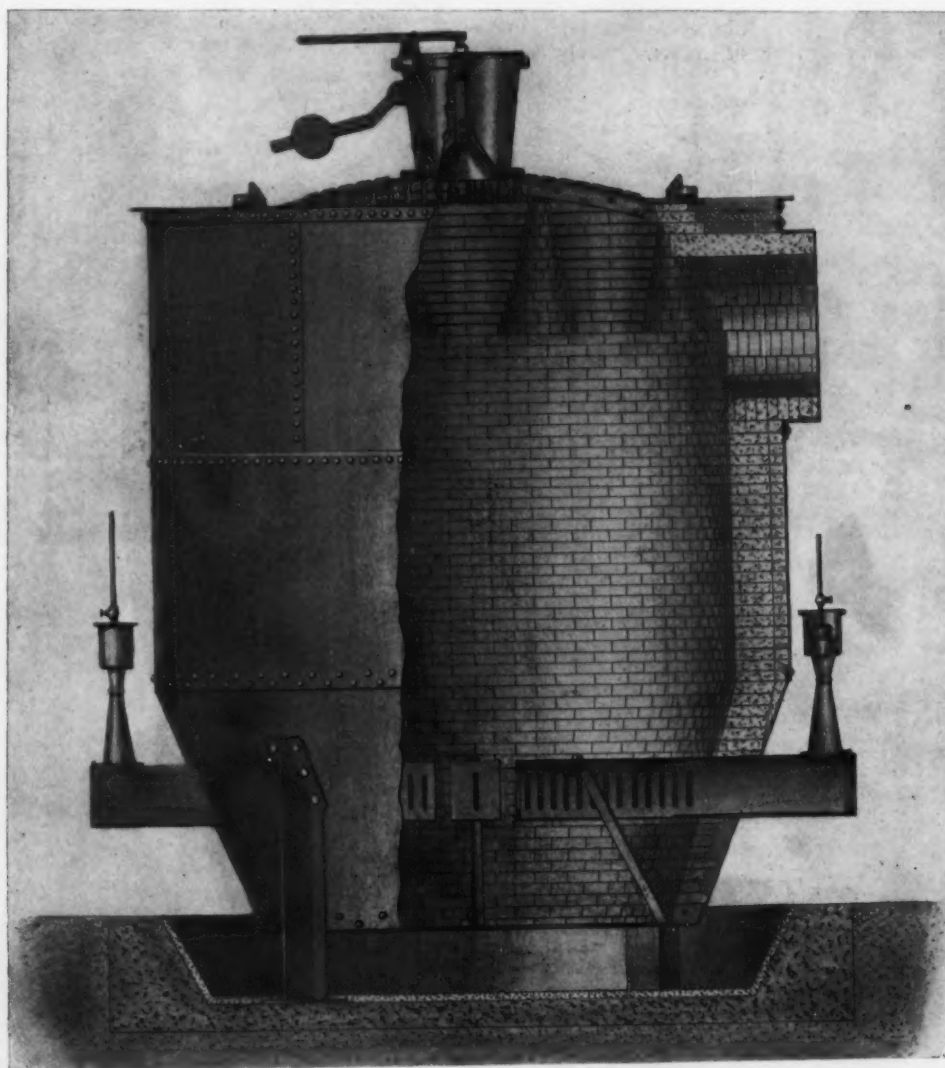
in.; the hole in the spindle is 11-16 in., and the taper hole at the end is adapted for a No. 10 B. & S. arbor. The 32 changes of speed range from 0.003 to 0.225 in. per revolution of the spindle. The machine occupies a floor space of 79½ by 86 in., allowing the extreme movements of the table, and weighs 2850 lb.

The Herrick Gas Generator.

The Herrick producer, built by the Industrial Gas Company, New York, and designed by its chief engineer, James A. Herrick, like other producers of the best types, is cylindrical in shape and extends into a water seal contained in a concrete pan. When in operation a bed of

on the injector principle and introduces the necessary amount of air and steam for making the gas. The air and steam, thoroughly mixed, pass through the slots in the sides and ends of the tuyeres and are evenly and thoroughly distributed over the entire generating area of the producer. The center blower formerly used in the Herrick producers was less effective, because the bulk of the air and steam reached only the central portion of the fuel column and the full capacity of the generator was not obtained.

The tuyeres in this later producer are so effective as to give it certain advantages over the generators employing center mushroom blowers or inclined grates. For example, when using run of mine bituminous coal, center blower generators gasify from 10 to 12 lb. of coal per



The Herrick Gas Generator, with Water Seal and Patented Tuyeres and Brick Studded Top.

coal rests upon a bed of ashes and the downward progress of the burning fuel is not obstructed by a grate or other device, but the fuel is lowered uniformly by the removal of the ashes from below through the water seal. The distinctive and exclusive features of the Herrick producer are the tuyeres, or devices through which the air and steam are introduced into the fuel column, and the brick studded generator top.

Especially good results are claimed to be secured by the tuyeres. These are cast iron boxes and, as may be seen in the illustration, project through the steel shell and brick lining of the lower part of the generator into the ashes. The parts of these boxes extending into the generator are entirely open at the bottom and also have a number of slots in the sides and ends. The slots, it will be observed, do not extend clear to the brickwork of the producer, which prevents currents from passing up along the sides. Each tuyere is equipped with a steam jet blower attached to the outer end, which acts

square foot of generating area, requiring a steam pressure ranging from 25 to 80 lb., and it is stated they cannot be successfully operated with a pressure less than 25 lb. The Herrick generator, it is claimed, gasifies 18 to 20 lb. of coal per square foot of generating area with a steam pressure of from 15 to 20 lb., and gasifies as high as 25 or 26 lb. of coal per square foot of generating area with 30 lb. steam pressure, while the generator may be and often is operated successfully with as low as 1 lb. of steam pressure. Frequently at the end of a run, when only a small amount of heavy gas is required, the generator is operated without any steam pressure, simply by the draft induced by the furnace stack. The normal capacity of the Herrick generator is declared to be fully 80 per cent. greater than that of any other type, and this is due entirely to the tuyeres.

Another striking assertion is that the Herrick generator will operate satisfactorily and continuously on low grade slack coals which clog and stop other pro-

ducers in a few hours, and will gasify 20 per cent. more slack coal than can be gasified from run of mine coal by the best center blower generators. The capacities stated above are based not upon strained or poor conditions, but upon the production of gas of the best quality, with the following average analysis from the general run of bituminous slack coals and with the generator in charge of common labor:

Carbon monoxide, CO.....	0.27
Hydrogen, H ₂	0.15
Marsh gas, CH ₄	0.035
Heavy hydrocarbons.....	0.015
Carbon dioxide, CO ₂	0.03
Nitrogen, N ₂	0.50
Total.....	1.00

There is also approximately 5 per cent. by weight of tar and soot in suspension, which does not show in an analysis.

The top of the generator is made of heavy cast iron, filled as thickly as possible with fire brick. The bricks are cast into the iron, which is poured about them. When the producer is first operated a deposit of carbon, in the form of a hard coke or graphite, accumulates between the lower ends of the bricks where they project below the iron. When these spaces have been filled so that the under side of the top presents a smooth surface no further deposit is made. This deposit bakes hard and makes a practically unbreakable top, which is also heat proof. These tops are more expensive than water cooled tops, but are considered very much more satisfactory, as they are not likely to break and they further provide a dry as well as a cool operating floor for the men in charge of the generator. Another feature of the Herrick top is the provision for expansion and contraction. The top is made of four quadrants bolted together, which provide for expansion and contraction without strain on the metal. In this way the likelihood of cracks or breaks is practically eliminated, and the durability of the body greatly increased.

The poke hole cover is a heavy hinged casting, fitted tight and opened by a foot lever. These poke holes are located near the edge of the inner wall, so that the operator can use his poker to scrape the inner surface of the generator and remove the clinkers if any become attached. On account of this convenient arrangement and the fact that very few clinkers are formed, less labor is required for the operation. One man can easily care for two or three generators.

Herrick generators for raw bituminous producer gas and also for anthracite producer gas in sizes above 5 ft. 6 in. inside diameter are built as has been described. Below that size shaking grates and tight bottoms are used. The following table gives the sizes in which the generator illustrated is built and the hourly capacity with different grades of coal:

Size in feet.		Pounds gasified per hour.		
Outside diameter.	Inside brick.	Slack at 15-20 lb. steam.	Run of Mine, 15-20 lb. steam.	Run of mine, 25-30 lb. steam.
7½	6	325	500	700
8½	7	450	700	1,000
10	8	600	900	1,300
12	10	800	1,200	1,500

The distinctive advantages of the Herrick producer, as has been said, are due to the tuyeres, the design and use of which are covered by basic patents. It is possible to change over other producers at small expense so as to use these tuyeres, and the company is prepared to furnish tuyeres and designs for their adoption in connection with all standard makes of producers.

The American Steel Package Company, Defiance, Ohio, is manufacturing sheet steel cases for handling bottles. The company is said to be the only manufacturer of this class of goods. A new industry has thus developed in replacing wooden articles with steel. The company is distributing circulars illustrating an entire train load of steel bottle cases recently dispatched to a single customer. This is claimed to be the largest single shipment of bottle cases, either wood or steel, ever made. In 1903 the company made its first shipment, consisting of 25 cases, and this train load comprised 30,000 cases.

The Cable System in Telephone Line Construction.

The annual report of the American Telephone & Telegraph Company contains the following interesting paragraphs on progress and development in the telephone business:

The improvement in cables within the past few years has revolutionized the art of telephone line construction. Not only is it now possible to place in underground ducts cables containing 400 or even 600 circuits, but a pole line, the carrying capacity of which would have been exhausted by 40 pairs of open wires, can carry 600 pairs of wires in the form of cables. The old fashioned exchange pole line rarely carried more than 20 pairs of open wires. Sound economy has many times in the past year required the scraping of all the wires on a pole line, cable being substituted for them as the only way of securing the enlargement of facilities required, and not unfrequently has it been necessary to reconstruct the whole line as the cheapest way of securing the opportunity for growth that was required.

If the very great development of the business could have been foreseen, and the engineers and manufacturers had at an early date solved the cable problem so that cables of large capacity could have been originally installed, instead of open wire, in places where a large number of circuits would ultimately be required, much money would have been saved.

Now that it is certain that the business will develop on lines of reasonable profit to an extent much greater than even the most enthusiastic telephone man ventured to expect a few years ago, it would be the height of folly not to anticipate the certain extension of the business by providing facilities for growth when they can be most economically installed.

The great extent to which the telephone business was sure to develop became apparent about the year 1901, when the number of new subscribers increased nearly 220,000, as compared with about 167,000, the largest increase in any prior year. The large increases in the number of subscribers through 1905, which was attended by an equally large increase in toll service, practically exhausted the plant of the Bell Companies and involved rebuilding that plant to a large extent. The year 1906 has seen additions to construction which not only enabled the companies to take care of the 2,241,367 subscribers connected with the system on January 1, 1906, and the nearly 500,000 added during the year, but which resulted in plant conditions which will enable future growth to be taken care of with economy. Constant additions will have to be made to the plant, but they will largely be on predetermined lines, utilizing, extending and rounding out the systematic plant conditions that now exist.

The Board of Trustees of the Rensselaer Polytechnic Institute, Troy, N. Y., voted, at a recent meeting, to establish courses in mechanical and electrical engineering. This institution, which was the first where purely technical instruction was given in the English language, was founded in 1826, and since that time has maintained a high rank as a school in civil engineering. The question of broadening the scope has been under discussion for some time, and recently means have been acquired through Mrs. Russell Sage, so that it will be possible to give these courses and maintain the high standard which has been set for many years in the school for civil engineering. Several new buildings and much new equipment have been added to the course in civil engineering recently. The course in metallurgy has been strengthened, and Enrique Touceda, Albany, N. Y., has been elected professor of metallurgy.

The eight new hot mills which the American Sheet & Tin Plate Company is adding to its Vandergrift Works will be ready for operation between April 15 and May 1, and will give the plant a total of 37 hot mills, making it by far the largest works in the country devoted to the manufacture of black and galvanized sheets.

Iron and Steel Nomenclature.

Definitions Designed to Secure Uniformity.

The report of the Committee on the Uniform Nomenclature of Iron and Steel presented at the Brussels Congress of the International Association for Testing Materials, September 3-9, 1906, is to be submitted to the Iron and Steel Institute and kindred organizations for their indorsement. After adopting it the Brussels Congress asked the committee to continue its work, with a view to securing the foreign equivalents of the terms defined in English in its report. This latter labor the committee has prosecuted to some extent, and its report is accompanied by a chart giving a polygot in English, French, German, Swedish, Danish and Dutch, of various terms applying to pig irons, steels and wrought iron and the apparatus in which they are made. Prof. Henry M. Howe, Columbia University, New York, is chairman of the committee, and Albert Sauveur, Harvard University, Cambridge, Mass., secretary. A third American member of the committee is H. H. Campbell, Steelton, Pa. The metallurgical definitions as presented by the committee are given below, also a few definitions of special sizes or shapes of iron and steel, and a suggestion as to the line of demarcation between iron and steel:

Definitions.

Alloy Cast Irons.—Those which owe their properties chiefly to the presence of an element (or elements) other than carbon.

Alloy Steels.—Those which owe their properties chiefly to the presence of an element (or elements) other than carbon.

Basic Pig Iron.—In America, pig iron containing so little silicon and sulphur that it is suited for easy conversion into steel by the basic open-hearth process. It is restricted to pig iron containing not more than 1.00 per cent. of silicon.

Bessemer Pig Iron.—That which contains so little phosphorus and sulphur that it can be used by itself for conversion into steel by the original or acid Bessemer process. In America this term is restricted to pig iron containing not more than 0.10 per cent. of phosphorus.

Bessemer Steel.—Steel made by the Bessemer process, whether its carbon content is high, low or intermediate.

Blister Steel.—Steel made by carburizing wrought iron by heating it in contact with carbonaceous matter. It might also be made by so carburizing a low-carbon steel.

Cast Iron.—Generically, iron containing so much carbon or its equivalent that it is not malleable at any temperature. Specifically, cast iron in the form of castings other than pigs, or remelted cast iron suitable for casting into such castings, as distinguished from pig iron.—i. e., cast iron in pigs, etc. For instance, cast iron pigs—i. e., pig iron, like lead in pigs, i. e., pig lead—is remelted and cast into castings, such as columns, locks, gears, etc., of special shape suited to their special purpose; these are specifically called "cast iron," and this is the usual restricted meaning of "cast iron" in trade language. The committee recommends drawing the line between cast iron and steel at 2.20 per cent. carbon for the reason that this appears from the results of Carpenter and Keeling to be the critical percentage of carbon corresponding to the point "a" in the diagrams of Roberts-Austen and Roozeboom. As to the signification of this critical point the committee is not prepared to express an opinion. Prof. Wedding reported that in Germany every metallic product of the blast furnace is called pig iron or cast iron, and appeared to dissent from drawing any line between cast iron and steel. Mr. Brinell thought 2.20 per cent. of carbon a rather high limit for practical purposes.

Cast Steel.—The same as crucible steel. Obsolescent, and to be avoided because confusing and because a temptation to fraud.

Cemented Steel.—The same as blister steel.

Charcoal Hearth Cast Iron.—Cast iron which has had its silicon and usually its phosphorus removed in the

charcoal hearth, but still contains so much carbon as to be distinctly cast iron.

Converted Steel.—The same as blister steel.

Crucible Steel.—Steel made by the crucible process, whether its carbon content is high, low or intermediate.

Gray Pig Iron and Gray Cast Iron.—Pig iron and cast iron in the fracture of which the iron itself is nearly or quite concealed by graphite, so that the fracture has the gray color of graphite.

Hematite Pig Iron.—Originally pig iron made from the hematite ores of England, which happen to be so free from phosphorus and sulphur that the pig iron made from them can be used by itself for the acid Bessemer process. By association it has come to mean any pig iron thus relatively free from phosphorus and sulphur. The term is not used in America and is undesirable.

Hot Metal or Direct Metal.—The molten cast iron from the blast furnace before it has been allowed to solidify.

Ingot Iron.—Steel cast into an initially malleable mass and containing so little carbon or its equivalent that it does not harden greatly on sudden cooling. The word is rarely used in English, "mild steel" or "low carbon steel" or "soft steel" being generally used in its place. In America the line between soft steel and half-hard steel is usually drawn at a carbon content of about 0.20 per cent.

Ingot Steel.—Steel cast into an initially malleable mass and containing so much carbon or its equivalent that it hardens greatly on sudden cooling. The word is rarely used in English, but "hard steel," "high carbon steel" or "half-hard steel" are used in its place.

Malleable Castings.—Castings of malleable cast iron, which see.

Malleable Cast Iron.—Iron which when first made is cast in the condition of cast iron, and is made malleable by subsequent treatment without fusion. Although the English name of this variety suggests that it is cast iron, it is not truly a variety of cast iron, but rather forms an independent species of iron, because it lacks the essential property of cast iron, viz., its extreme brittleness. Though the term "malleable castings" is very common, the term "malleable cast iron" is very rarely used. The common but inexcusable term, we regret to say, is "malleable," pronounced "mallable," used as a substantive. Those with some respect for their mother tongue, if asked of what material a malleable casting was composed, would generally use a circumlocution.

Malleable Iron.—The same as wrought iron. Used in Great Britain, but not in the United States, except carelessly as meaning "malleable cast iron" (vulgar "malleable").

Malleable Pig Iron.—An American trade name for the pig iron suitable for converting into malleable castings through the process of melting, treating when molten, casting in a brittle state, and then making malleable without remelting. The term should be used with care to avoid confusion. This material is also called in trade in America "malleable iron," but this use should be avoided, because "maleable iron" has the older and (in Great Britain) firmly established meaning of "wrought iron."

Mottled Pig Iron and Mottled Cast Iron.—Pig iron and cast iron the structure of which is mottled, with white parts in which no graphite is seen, and gray parts in which graphite is seen.

Open Hearth Steel.—Steel made by the open hearth process, whether its carbon content is high, low or intermediate.

Pig Iron.—Cast iron which has been cast into pigs direct from the blast furnace. This name is also applied to molten cast iron which is about to be so cast into pigs or is in a condition in which it could readily be cast into pigs.

Plate Iron.—A name applied in Great Britain to refined cast iron.

Puddled Iron.—Wrought iron made by the puddling process.

Puddled Steel.—Steel made by the puddling process, and necessarily slag-bearing. (See Weld steel.)

Refined Cast Iron.—Cast iron which has had most of

its silicon removed in the refinery furnace, but still contains so much carbon as to be distinctly cast iron.

Shear Steel.—Steel, usually in the form of bars, made from blister steel by shearing it into short lengths, piling, and welding these by rolling or hammering them at a welding heat. If this process of shearing, piling, etc., is repeated, the product is called "double shear steel."

Steel.—Iron which is malleable at least in some one range of temperature, and in addition is either (a) cast into an initially malleable mass; or, (b) is capable of hardening greatly by sudden cooling; or, (c) is both so cast and so capable of hardening. Variety (a) includes also molten iron which if cast would be malleable, as do its two sub-varieties, "ingot-iron" and "ingot steel." (Tungsten steel is malleable only when red hot.)

Steel Cast (adjective).—Consisting of solid Bessemer, open hearth, crucible or other slagless steel, and neither forged nor rolled; applied to steel castings. For instance, a "steel cast" gun is a gun which is a steel casting—i. e., which has been neither forged nor rolled. To call it a "cast steel" gun would imply that it was made of crucible steel, to which the term "cast steel" is restricted.

Steel Castings.—Unforged and unrolled castings made of Bessemer, open hearth, crucible or any other steel. Ingots and pigs are in a sense castings. The term "steel castings" is used in a more restricted sense, excluding ingots and pigs and including only specially shaped castings, such as are generally used without forging or rolling. They may, however, later be forged—e. g., under the drop press—when they cease to be "castings" and become "drop forgings," of if only part is forged then they are partly forgings and partly castings.

Washed Metal.—Cast iron from which most of the silicon and phosphorus have been removed by the Bell-Krupp process without removing much of the carbon, so that it still contains enough carbon to be classed as cast iron. The name "washed metal" is extended to cover this product even if its carbon is somewhat below the proper limit for cast iron.

Weld Iron.—The same as wrought iron. Obsolescent and needless.

Weld Steel.—Iron containing sufficient carbon to be capable of hardening greatly by sudden cooling, and in addition slag-bearing because made by welding together pasty particles of metal in a bath of slag, as in puddling, and not later freed from that slag by melting. The term is rarely used.

White Pig Iron and White Cast Iron.—Pig iron and cast iron in the fracture of which little or no graphite is visible, so that their fracture is silvery and white.

Wrought Iron.—Slag-bearing, malleable iron, which does not harden materially when suddenly cooled.

Wrought Steel.—The same as weld steel. Rarely used.

Special Sizes or Shapes of Iron and Steel.

Bar Iron.—Wrought iron in the form of bars, rods, etc.

Muck Bar.—The wrought bars usually 1 in. thick and about 4 in. wide, made by the first rolling of a ball of puddled iron.

Merchant Bar.—Wrought iron in the form of merchantable bars or rods made by shearing muck bar into short lengths, piling it and rolling or forging it at a welding heat.

Bloom.—1. A large bar, drawn from an ingot or similar mass, for further manufacture. 2. A rough bar of wrought iron drawn from a Catalan or bloomary ball for further manufacture.

Billet.—A small bar drawn from a pile, bloom or ingot for further manufacture. The committee recommends that the line between blooms and billets be drawn at the size of 5 in. square, as representing common custom.

Slab.—A flat piece or plate, with its largest surfaces plane drawn or sheared from an ingot or like mass for further treatment.

The Boundary Between Steel and Iron.

It would be well to decide on a definite carbon-content to serve as a boundary line between ingot iron and ingot steel, between puddled iron and puddled steel, and between any other varieties of wrought iron and weld steel,

Two plans have been considered. One is to draw this line at 0.32 per cent. carbon or its equivalent in other elements, for the reason that this carbon content appears to correspond to the critical point O in the diagrams of Roberts-Austen and Roozeboom. This has the merit of corresponding to a definite physical boundary. Mr. Pourcel would classify solely according to the presence or absence of slag, so that "steel" should include all forms of iron freed from slag by fusion and cast in a malleable condition, and "wrought iron" should include all classes produced in a pasty condition. He does not think that any cross classification according to the proportion of carbon is expedient.

The other plan is to draw the boundary at 0.20 per cent. of carbon, because this is a convenient place to separate the important classes "soft steel" and "half hard steel" so that if this point were adopted "ingot iron" would be synonymous with "soft steel," and "ingot steel" would be the equivalent of the two classes "half-hard steel" and "hard steel."

The Otis Elevator Company's Report.

The Otis Elevator Company's report for the year ending December 31, 1906, shows a slight decrease in net earnings as compared with the previous year. Omitting cents, the income account compares as follows, deductions having, of course, been made for fixed charges, renewals and repairs:

	1906.	1905.	Decrease.
Net earnings.....	\$855,167	\$912,938*	\$57,771
Preferred dividends (5%)..	347,791	339,697	8,094
Balance	\$507,376	\$573,241	\$65,865
Common dividends (3%)...	191,259	127,006	*64,253
Balance	\$316,117	\$446,235	\$130,118
Depreciation	216,117	246,235	30,118
Surplus	\$100,000	\$200,000	\$100,000
Previous surplus.....	1,600,000	1,400,000	*200,000
Total surplus.....	\$1,700,000	\$1,600,000	*\$100,000

* Increase. † 2%.

The accompanying statement by President W. D. Baldwin is as follows:

"There has been expended for the purchase of real estate, new buildings, equipment (exclusive of repairs and maintenance of plants) and acquisition of outstanding stock of subsidiary companies, the sum of \$1,214,420; of which sum \$1,020,420.47 has been paid in cash, and the remainder in stock from the company's treasury. These expenditures have called for large cash disbursements, in addition to the increased requirements (working capital) for carrying to completion the company's contracts. The capacity and condition of the company's plants are to-day such as to not only justify the large expenditures made in the past, but also the expectation that the present shops will be able to take care of the larger volume of business anticipated this year, and to much greater advantage than heretofore, both in the line of prompt deliveries and reduced cost of production.

"The increased prices paid for labor and materials, together with the increased cost of operation, due to effecting changes and improvements in the plant, and the volume of business done in certain grades of work have tended to reduce the margin of profit over previous years. In following out the policy since the organization of the company, as heretofore, the directors have made liberal reductions for possible depreciation of raw material and finished stock on hand, maintenance of plants, cost of improvements, equipment, &c.

"During the year it was deemed advisable to organize Otis Elevator companies of Illinois, Pennsylvania, Missouri and Texas, to conduct the business formerly carried on by your company in their respective territories, and the statements herewith submitted include the results of the operations of those companies."

The John H. McGowan Company, Cincinnati, Ohio, manufacturer of pumps, air compressors, &c., has opened an office in room 723 Bessemer Building, Pittsburgh, in charge of H. J. Koontz.

The E. J. Manville Company's Screw Slotter.

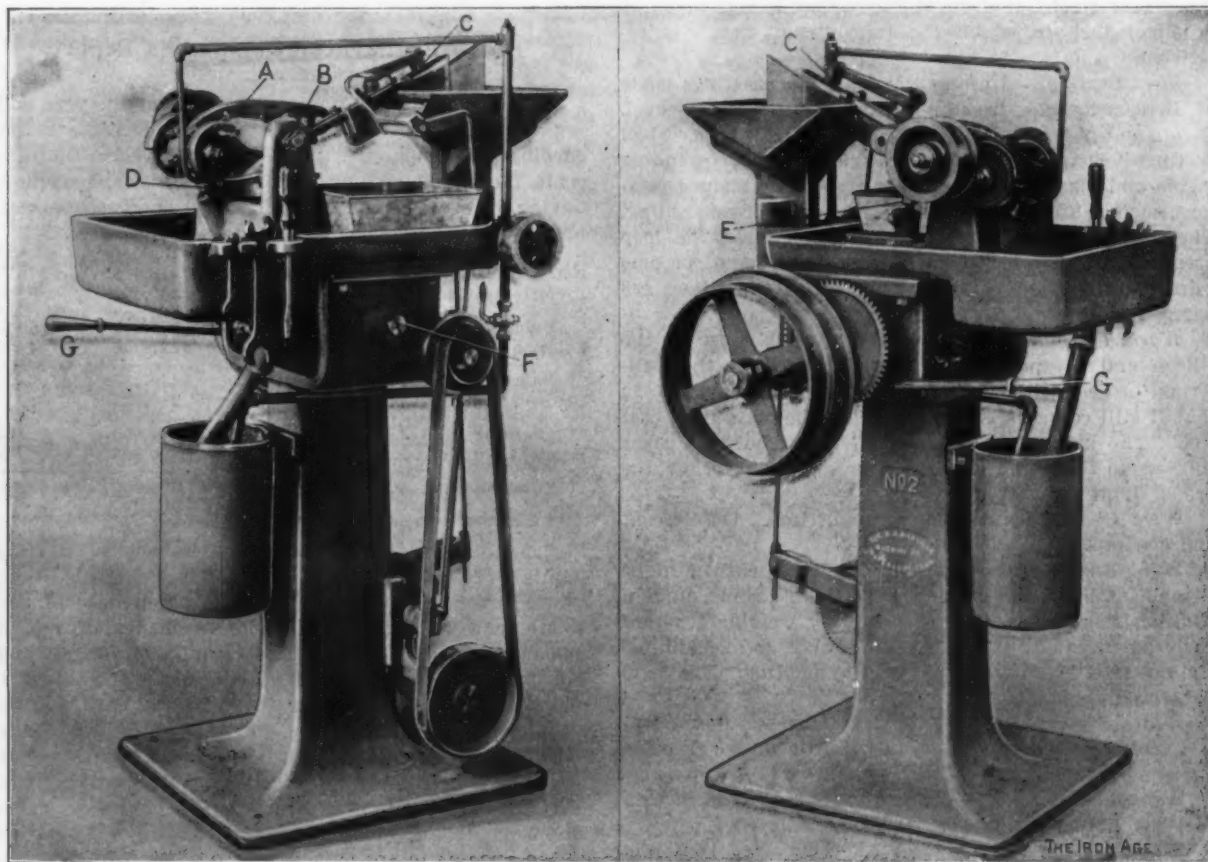
A number of important improvements have been made to the automatic cross feed screw slotting machine built by the E. J. Manville Machine Company, Waterbury, Conn. The two views of opposite sides of the machine give a general idea of the changes. The dial mechanism has been altered to afford a greater capacity, a comb attachment has been added to the feeding mechanism to insure that every screw reaches its dial die in correct position, and various other refinements of mechanism and general design have been made to improve the efficiency of the machine.

The carrying dial D is now furnished with six instead of four removable dies to take the work, feed it to the saw and hold it while the slotting operation is performed. Each die has three notches, which may be of different sizes to take several classes of work. After each one-sixth turn of the dial the saw drops rapidly until it

through much or little space, according as the head to be slotted is thick or thin, giving all possible time to the sawing. The dial is driven by friction gearing, so arranged that the tension is self-adjusting, and making it impossible for harm to come to the machine should a blank get caught and prevent the rotation of the dial.

Another change is in the disposal of finished work. After a screw has been slotted it is held in its die by a guard until it has passed to a point at the rear, where it is released to fall into a pan. In this way the screws are separated cleanly from chips and oil.

The comb device C, referred to before, is important in this type of machine in making certain the position of a screw as it reaches its die of the carrying dial. The screws are fed to the tracks, down which they slide by gravity to the dies, by the usual blade elevating device in the hopper. It occasionally happens with all kinds of screws and frequently with some shapes that blanks reach the track in other than the proper position—



Two Views of the Improved Automatic Feed Screw Slotting Machine Built by the E. J. Manville Company, Waterbury, Conn.

touches the screw head and then moves slowly to the required depth. While the slot in the screw head is being cut the screw is gripped by an adjustable clamping mechanism and a retaining device holds the dial at rest, and then releases it during the movement to the next die. The saw is carried to and from the work by the rotation of a shaft, B, supported in eccentric bearings, upon which is mounted the saw carrying frame A, the arrangement being such that the median plane of the saw is always coincident with the axis of the screw. The depth of the cut is regulated and variation in diameter of saws used is compensated for by lengthening or shortening the link which connects the saw carrying frame A with the saw feed cam on the gear driven shaft F, extending through the enlarged part of the base at the top of the pedestal. In an arm of the saw carrying frame are three holes to take the link pin. By moving the pin from one hole to another the arc through which the saw can move is varied. A turnbuckle, E, in the link determines the maximum depth of the saw slot in the work. Thus in connection with the cam movement a valuable feature is provided, that of slow milling

that is, with the head resting squarely on the track and the shank hanging downward. Should a screw out of position reach a die it might cause mischief, though with this machine nothing more serious could result than a stopping of the feed, since the friction gearing acts as a safeguard. The comb consists of a sheet steel part held by an arm and having an opening in the form of the head of the screw which is being slotted, so that a blank properly placed on the track passes through without interference, but a blank out of position is caught, swept back and dropped into the hopper. The comb moves backward and forward along the track simultaneously with the rise and fall of the elevating blade of the hopper, the motion of the two being given by the same crankshaft at the base of the machine. A comb can be quickly replaced when another form of screw is to be slotted.

The handle G, on the left side of the machine, extending to the front, operates a clutch which disengages the main driving pulley and stops all of the operating movements, but allows the saw and pump to continue to revolve.

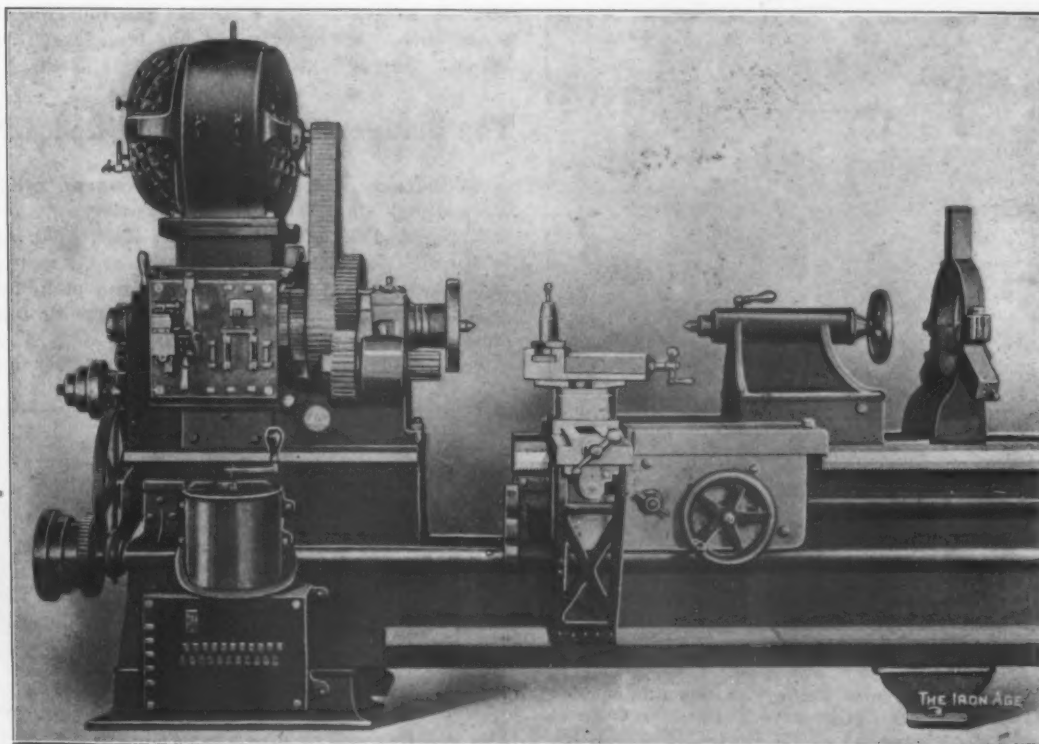
The Fay & Scott Improved Extension Gap Lathe

A new improved 24 to 46 in. extension gap engine lathe, equipped with motor drive, and built by Fay & Scott, Dexter, Maine, to accord with Government specifications, is shown in the accompanying engravings. Aside from its ability to do accurately and well all the work within its ordinary capacity it is capable of turning work of large diameters and extra lengths. For example, the 8-ft. lathe, with the sliding bed closed, will swing 24 in. and take between centers 3 ft. With the gap open and extended its maximum amount it will take work up to 46 in. in diameter and 5½ ft. long. Each foot added to the length of the bed increases the gap opening 6 in. The 8-ft. lathe weighs 6600 lb., and longer ones weigh 350 lb. more for each additional foot of bed length. The lathe illustrated is driven by a 5-hp. 2 to 1 direct current Crocker-Wheeler motor, with a variable speed controller giving 10 speeds, ranging from 870 to 1500 rev. per min. In ad-

dition the lathe is double back geared, tripling the number of speed changes, the gears being engaged by a sliding key in the back gear quill. A large full swing face plate, which is not shown in the engraving, is furnished with the lathe, and is driven direct by a pinion engaging an internal gear in the back of the plate.

The head spindle is of high carbon steel, with journals ground to size. The spindle bearings are of bronze, and are scraped and fitted. The tailstock is of the cut-away type, and can be set off center for turning taper work. The carriage is extended for turning the full swing of the lathe, and is rigidly supported at the front end by an angle bracket, which has an adjustable gib at its foot, where it rests on a machined way at the bottom of the bed. The apron is tongued and grooved into the carriage, and all gears and studs are of ample proportions.

Included with the lathe as equipment are the countershaft, center rest, large and small face plates, wrenches and a complete set of change gears. Additional attachments can be furnished as follows: Taper attachment, follower rest, turrets fitted to a carriage or V's, and a friction headstock, triple geared direct to the face plate. The ordinary back gearing has a ratio of 12 to 1, the triple gearing 34 to 1. The swing over the bed, as before stated, is 24 in., and over the carriage 17 in., and through the gap 46 in. The hole through the spindle is



A Motor Driven 24-46 In. Extension Gap Lathe Built by Fay & Scott, Dexter, Maine.

is in the right position, or through belts between two three-step cone pulleys, when the proper clutch is engaged by moving the handle to its opposite position. When no feed is desired another lever at the top of the headstock on the left hand end disengages the drive from the spindle.

The Joseph Iron & Equipment Company, of which Isaac Joseph of the Isaac Joseph Iron Company, Cincinnati, Ohio, is president, G. G. Bergman secretary and Harry Wright general manager, is operating a plant covering several acres in the City of Mexico, with its general offices at 406 Mutual Building in that city. The business of the company comprises the purchase and sale of iron and steel rails, locomotives, steam shovels, railroad cars of all kinds, railroad and contractors' equipment, relaying rails and scrap iron and steel, as well as the agency for Mexico of the Shay patent geared locomotive.

In January the production of pig iron in Germany was 1,062,152 metric tons against 1,064,638 tons in December and 1,018,461 tons in January, 1906. Of the January production this year 686,901 tons was Thomas or basic iron; 40,712 tons Bessemer iron, 87,493 tons ferro and spiegel, 69,503 tons forge iron and 177,543 tons foundry iron.

A New Gas Burner Soda Kettle.

The soda and potash kettle with gas burner heating attachment, shown in the illustration, is arranged to give a constant, predetermined temperature of the bath used in cleaning work of oil and greasy dirt in machine shops, factories and electroplating works. The bath is heated by a burner to which gas is admitted through a valve controlled by a thermostat. The valve remains open until the heat of the kettle reaches the point at which the thermostat is set, when the heat, acting through the thermostat plug extending into the bath, automatically



An Improved Soda and Potash Kettle with Gas Burner, Made by the Manufacturing Equipment & Engineering Company, Boston, Mass.

opens a water valve, admitting pressure through a pipe to the gas valve, closing it and shutting off the supply of gas to the burner. When the bath falls below the required temperature the thermostatic valve closes, the water in the connecting pipe discharges into the slop basin and pressure is released from the gas valve, admitting gas, so that the burner is again lighted by a pilot lamp which is kept constantly burning.

The slop basin is at one side of the kettle and may be seen at the top near the right in the illustration. It is arranged so that the dirty water can be easily disposed of. It also acts as an overflow if the water supply should be accidentally left open and is convenient in getting rid of scum. The cover can be removed at any time and the entire volume of the kettle made available for large work. The kettle is manufactured by the Manufacturing Equipment & Engineering Company, 200 Washington street, Boston, Mass.

The Spanish Steel Syndicate.

Since the beginning of the current year the Spanish Steel Syndicate has been in operation, the sales being handled by the Central Siderurgica, calla de Serano 2, Madrid, whose director is Joaquin Angoloti and whose secretary is Mariano Cagegal. The syndicate takes in all the makers of merchant products, shapes, sheets and plates, the allotment being as follows:

Merchant products.	Shapes.	Plates.
Per cent.	Per cent.	Per cent.
Altos Hornos.....47	45	56
Duro Felguera.....13	31.85	27.60
Mieres.....13	2.50	6
Moreda y Gijon.....6	..	..
Martinez Rivas.....4	10	10
Material Ferrocarriles.....4	10.65	..
Hijos de Garcia.....4	..	..
Santa Ana de Bolueta.....2	..	..
Fabrica de Bidasoa.....1.5	..	..
Viuda de Urgoitia.....2	..	..
Vergatajauregui.....1.5	..	..

Three concerns agree to stop work and receive the following annual subsidies: Barconia, 100,000 pesetas; Purisima Concepcion, 37,000 pesetas, and Echevarria e Hijos, 20,000 pesetas. On account of the new allotment Fabrica de Bidasoa receives annually 30,000 pesetas and Viuda de Urgoitia 30,000 pesetas. Prices for products are to be so regulated that no foreign material can be imported. They are based on the export price at Antwerp, plus 10 francs for port charges and plus the duty and exchange, and deducting 5 pesetas per ton from the total so reached. A new price-list has been issued and terms of sale, discounts, &c., have been established.

The Bridgeport Slitter and Disk Grinder.

A machine which, with minor changes, can be readily adapted for grinding a large variety of work is the slitter and disk grinder herewith illustrated, and made by the Bridgeport Safety Emery Wheel Company, Bridgeport, Conn. It can be equipped with a plain face plate, a Walker magnetic chuck, or plain three or four jawed chuck, but it is regularly furnished with a universal chuck adaptable for grinding punches, dies and miscel-

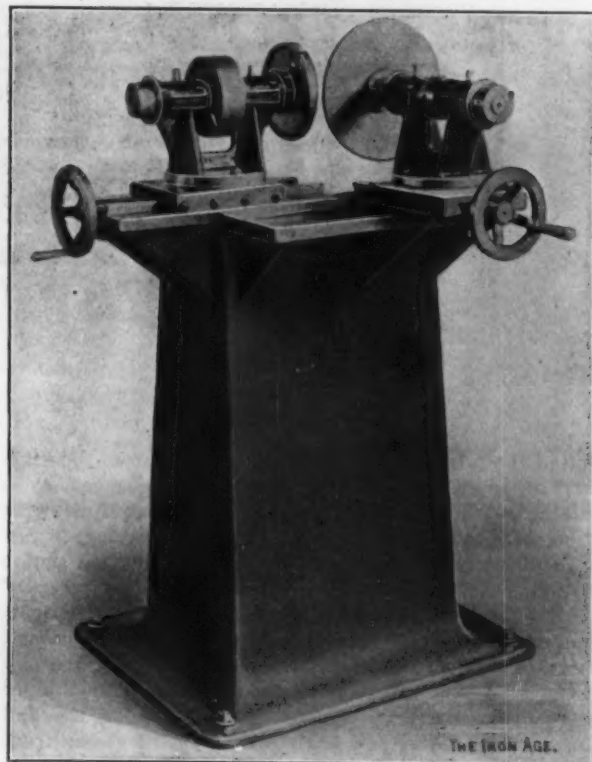


Fig. 1.—The Bridgeport Safety Emery Wheel Company's Slitter and Disk Grinder as Arranged for Dry Grinding.

laneous small parts of any sort having flat or circular faces which it is desired to accurately finish. The illustration, Fig. 1, shows the machine as arranged when intended for dry grinding. With the addition of a hood for the wheel and pump and piping for water supply, wet grinding can be equally well provided for. Pans are then arranged as desired to catch the water and conduct it back into a large water tank in the base. This part may be seen in Fig. 2, and also the centrifugal pump, which takes the water from the tank in the interior of the base and delivers it through piping to

the hood of the wheel. The dirt and sediment settle in the bottom of the tank, while the clear water is drawn from above by the pump and is forced to the wheel and work being ground.

The machine has an expanding arbor, which is opened or closed by means of a screw. Both heads swivel to any angle, making it possible to grind convex, concave or flat faces quickly. These heads are mounted on dovetailed ways gibbed to take up wear, and are fed in and out by hand wheels and screws. The spindles on the heads are arranged with ring check nuts to take up all end play. The machine alone and without wet grinding equipment weighs 500 lb., and stands about 40 in. high from the floor to the center of the spindle. The spindle is $1\frac{1}{2}$ in. in diameter in the bearings, and the latter are 4 in. long. From the ways on which the heads are mounted to the center of the spindle is 6 in., and when the wheel is new the distance between the platen and

those for the like period in 1906, without taking into account the important contract with the Italian Government.

George W. Jackson, Incorporated.

Four important industrial organizations, comprising the Jackson & Corbett Bridge & Steel Works, Interlocking Steel Sheeting Company, Jackson & Corbett Company, and George W. Jackson, consulting engineer, have been merged into George W. Jackson, Incorporated, Chicago, recently organized and incorporated in New York with a capital of \$3,000,000. Engineering contracts for the construction of subways, tunnels, heavy foundations, bridges and structural steel fabrication will engage the attention of the new corporation. Geo. W. Jackson, president, is widely known as an engineer, having de-

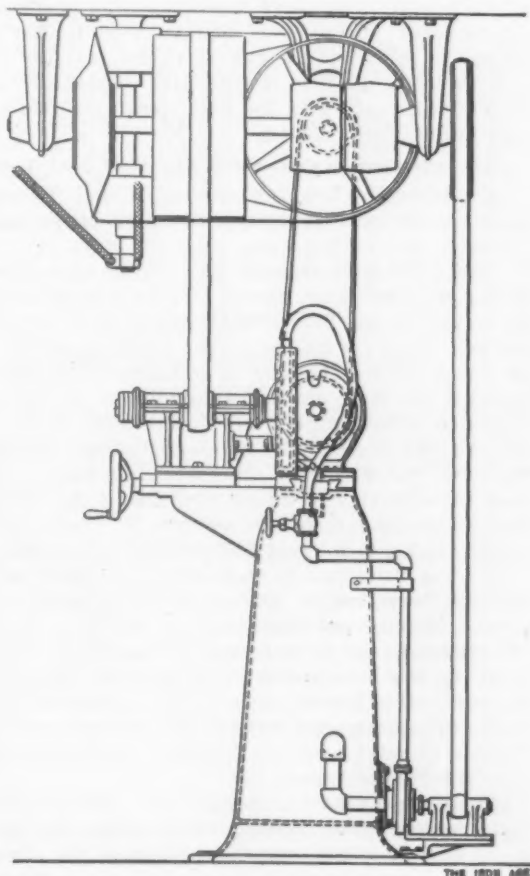
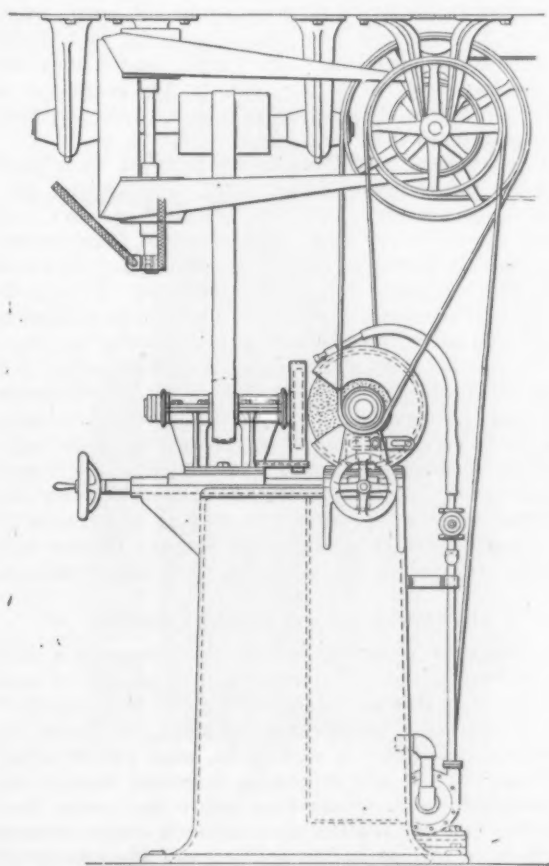


Fig. 2.—Side and End Elevations of the Bridgeport Silter and Disk Grinder, Showing Hood and Water Connections for Wet Grinding and the Countershaft and Belting.

wheel is also 6 in. The face plate is 7 in. in diameter and the wheel 10 in. in diameter by $\frac{1}{2}$ in. thick. The driving pulley on the head is a $2 \times 3\frac{1}{2}$ in. pulley.

Fig. 2 also shows the countershafting, providing the pulleys for driving the work spindle, grinding wheel spindle and pump.

The Westinghouse Companies in Europe.—J. H. Lukach, vice-president of the French Westinghouse Company of Paris, and also vice-president of the Westinghouse Electric Company of Russia, arrived in this country recently for a conference with the officials of the Westinghouse interests. Referring to the prospects of the Westinghouse Companies in Europe, he stated that the French Company has closed a contract that covers the electrification of an important portion of the Italian State railroads, which are owned by the government, namely, the Milan trunk line between Genoa and Milan, and calls for locomotives and electric equipment aggregating over 5,000,000 francs. The business of the French Company for the year ending December 31 aggregated 10,000,000 francs, while for this year the orders received in the electric and brake departments are almost double

signed and constructed several notable pieces of engineering work, chief among which is the Chicago Subway.

The company's offices are at present located on the tenth floor of the Borland Building, La Salle and Monroe streets, but will be removed about May 1 to 169-179 West Jackson boulevard, where it is completing a new warehouse and office building for its exclusive occupancy. A plant for the fabrication of structural shapes and the building of machinery is located at 80-98 Mendel street and 804-806 Elston avenue. Among the important contracts which the company now has under way is the construction of section 3 of the Southwest Land Tunnel, to be extended from a Chicago water works pumping station to the intake crib in Lake Michigan, $2\frac{3}{4}$ miles from shore. Preliminary plans for this work, which will cost over \$1,500,000, are now nearing completion. Beside the Polk street water tunnel from Jefferson street to the lake, which has just been completed, the contract for a water main tunnel under the Chicago River at Diversey boulevard has been secured, and other important engineering constructions are now in the hands of the company for the development of plans and specifications.

The Connellsville Coke Supply.

BY L. W. FOGG.*

The tremendous development of the iron and steel industries of the United States has been the cause of similar development in the coal and coke business of the country. In reading the very interesting article of Edward W. Parker in *The Iron Age* of February 7 one is at first amazed at the enormous resources that the United States contains in coal areas and the great wealth that lies undeveloped in the earth. What the relative values of these undeveloped coal deposits are, in comparison with those already developed, especially for the manufacture of coke, is the question which is now interesting coke manufacturers. The great drain on the coal fields of Fayette and Westmoreland counties in Pennsylvania (which, as Mr. Parker says, form a class of their own), that have been producing approximately 50 per cent. of the coke manufactured in the United States, is being felt to such an extent that the remaining life in the old field is a pressing consideration. This article deals only with the coal areas and coke production in these two counties.

The Pittsburgh Coal Seam and Its Local Names.

Connellsville, Lower Connellsville and Upper Connellsville are local names applied to the Pittsburgh seam of coal.

The Pittsburgh seam is one of the most persistent geological formations known. Confined within the limits of the outcrop lines it is as sure to be in its place as the soil which covers the earth. Lying in regular folds of slight grades, regular in thickness and purity, it presents the most economical conditions for the miner, conditions which are not met in any other seam. When the coal was formed it lay in one continuous coal blanket, but after the lifting of the earth's surface an erosion took place leaving a barren measure in the Pittsburgh seam, extending from 400 or 500 ft. to $2\frac{1}{2}$ miles in width. Lying to the east and north of this barren measure is the Connellsville coal, extending from the West Virginia-Pennsylvania State line northward through Greene, Fayette and Westmoreland counties. The Upper Connellsville coal is that part of this seam which lies north of the Loyalhanna River and the Pennsylvania Railroad. The Lower Connellsville consists of that part of the Pittsburgh seam lying in the southwestern part of Fayette County, south of Redstone Creek and west of the Connellsville outcrop.

These three subdivisions have their characteristics in their product. The Connellsville is softer coal and produces slightly larger coke than either of the other two, while the Lower Connellsville averages less in phosphorus and slightly more in ash than the Connellsville.

The Great Importance of Connellsville Coke.

Connellsville coke, the product from these two counties, is standard. It has been one of the factors which have made Pittsburgh what it is. It has produced for the furnaceman the best results in the manufacture of pig iron, and he is loth to accept a different product. Its worth is further shown in the increase in the value of coal lands during the past 10 years of from \$300 per acre to \$3000 per acre. An average price during the last year has been approximately \$1700 per acre. It has made the land owner independent, fortunes have been made by investors, and the operator who understands his business and has built on scientific principles has never failed to pay a good and sufficient dividend. It is a significant fact that there has not been an insolvency nor forced liquidation in the coke business of Fayette County in the past 34 years, or since the panic of 1873.

These reasons, together with its proximity to the Pittsburgh, Shenango and Mahoning districts and its excellent railroad facilities, are the most important causes for the demand for Connellsville coke.

Ten years ago the predictions were made by well informed operators in the Connellsville region that the coal

from the Lower Connellsville fields would never produce a quality of coke acceptable to the trade; that the Pittsburgh seam outside of the Connellsville District proper was only a steam coal proposition, and as a coking proposition it would never take the place of standard Connellsville. How far this judgment has erred is evident from the following figures:

Growth of the Lower Connellsville Output.

Connellsville coke in 1901 constituted 47 per cent. of the entire coke manufactured in the United States. In 1905 it was 35 per cent. Lower Connellsville produced 5 per cent. of the entire output in 1901, and in 1905 it made 12 per cent. Lower Connellsville increased its output 246 per cent. between the years 1901 and 1905. Today 95 per cent. of the Lower Connellsville coal lands is in the hands of operators, and the price of such lands has advanced in the last five years from \$300 to \$2000 per acre. The total original acreage of coal in the Lower Connellsville field is approximately 61,658 acres, and of the Connellsville field proper 88,576 acres. How much coal is left and how long it is going to last are the interesting questions. Mr. Parker states that the increase in output is 50 per cent. in five years. It is probably a fact that the increase between 1902 and 1907 has been greater than that given.

It is evident that Connellsville coke is each year losing its percentage relative to the total amount produced in the country, as in 1901 it was 47 per cent. and in 1905 it was 35 per cent. The output of Connellsville coke cannot be increased as fast as the demand, for there are no further tracts that can be developed. It is probable that in five years it will have reached its maximum output, and thereafter the supply will steadily and rapidly decline and coking plants go out of commission, and in 30 years the Connellsville field will be practically exhausted. The Lower Connellsville field, which only began to make coke seven years ago, will reach its maximum development about 1916, and thereafter the supply will rapidly decline, and plants with 20 and 30 years' life will from time to time drop out, so that in 40 years it will complete the exhaustion and Fayette County will have finished its coking industries from the Pittsburgh seam.

The Greene County Field Available.

It would be a serious matter to Pennsylvania and Ohio furnace interests if they should be obliged to look elsewhere than this immediate district for their supply of coke, but we know that lying west of Fayette County, in Greene County, there is waiting at least 160,000 acres of coking coal. It will supply the increased demand for the next 100 years. Some time before the Lower Connellsville coke has reached its maximum output Greene County coke will be in the market, and the history of this development will be as the Lower Connellsville has been. Its development will go forward rapidly, for, with the exhaustion of the older fields, this new field must make up the deficiency.

In reviewing the coking industry one comes to the conclusion that probably the best and cheapest coal was mined first, but there was also more waste in mining and carelessness in manufacturing coke. By improving the operating and manufacturing of coke we have produced and will continue to produce equally as good results from coal in the Pittsburgh seam lying west of the Connellsville basin.

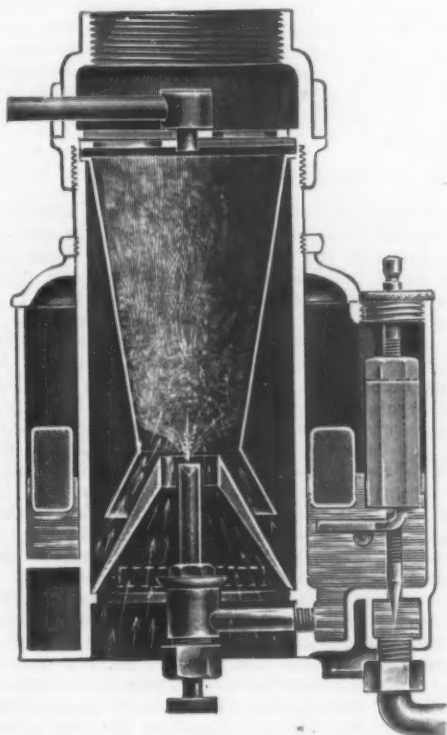
An announcement of special interest to those who in past days were regular purchasers of Scotch pig iron from the firm of James Lee & Co., New York, has been made under date of March 20. On that day this firm was succeeded by C. Tennant, Sons & Co., who will continue the same business at the old offices, 76 William street, New York. The firm of James Lee & Co. thus expires after a continuous existence of 82 years. After the death of William E. Leech on September 20, 1906, the sole surviving partner was John E. Leech. The firm which succeeds James Lee & Co. is an old London firm. It will conduct its business in this country as a corporation, of which Sir Edward P. Tennant is president and John E. Leech and William A. Tennant are vice-presidents.

* Mr. Fogg is general manager and constructing engineer of the Tower Hill Connellsville Coke Company, Uniontown, Pa.

The Bowers Carburetor.

A carburetor for gasoline engines, which appears to be of more than ordinary excellence, is the one herewith illustrated and manufactured by the F. E. Bowers Company, New Haven, Conn. It is particularly intended for automobiles and motor boats, but is equally applicable to gasoline engines as used for any purpose, and will doubtless be of interest to users of portable contractors' outfits. It is claimed to make possible a maximum efficiency of the motor, and to be of unusual flexibility in range of power and speed. Its purpose is to supply gasoline engines with a perfectly mixed vapor of the highest explosive consistency and to automatically regulate the density of the vapor to accord with different motor speeds.

The instrument is of the float-feed type, and has one main and two supplementary air inlets. The throttle is of an original design for which great sensitiveness is claimed and gives a central draft at all openings. The few adjustments which are necessary are simply made and positive. Hot water jackets or air inlets are not used or required, and the carburetor is made to vaporize



A Carburetor for Gasoline Engines Made by the F. E. Bowers Company, New Haven, Conn.

uniformly, irrespective of atmospheric conditions. All air from main or supplementary inlets is drawn directly through the gasoline spray, consequently the gas is completely formed before leaving the carburetor, and the density of the vapor is varied as it should be with the speed of the motor, but is never more dense or rare than is required to secure the best results at different motor speeds. These in brief are the main claims for the carburetor.

Its construction and operation will be understood from the sectional view. The spray nozzle A being concentric with the reservoir B there can be no change of level in the nozzle when the carburetor is not maintained in a perfectly upright position. Near the bottom of the center tube C is a short cone D, having a contracting internal diameter from 2 to $\frac{3}{4}$ in. The upper conical shell E has a full opening at its upper end and is restricted at its lower end an amount depending on the size of the motor. A flanged collar extending below it surrounds the cone D, leaving an annular space between the two, which varies in size according to the size of the upper cone inserted. The annular float F controls the gasoline inlet through the trip G, acting on the needle valve H. Slotted air openings are shown at I on each side of the

tube at the base of the lower cone, which connect with the supplementary air passages J, the entrance of the supplementary air being through two valves located on opposite sides at one end of the carburetor. The mixture is throttled at K, and the gasoline supply is adjusted by the needle valve L. The gasoline is introduced into the carburetor through the pipe M.

When the carburetor is in operation air first enters in a large volume through the base of the lower cone, and attains great velocity as it issues from it around the nozzle, drawing with it sufficient gasoline to produce a dense vapor suitable for starting. As the speed of the motor increases, a strong vacuum is created in the chamber C, which acts on the supplementary air valves, causing them to open and admit air. This air rushes over the outer walls of the cone D, meeting the rich vapor issuing at the top of the cone. Owing to the shape of the passage the air breaks through the center vapor with a whirlwind effect, breaking up the gasoline into minute particles, and expands into the gradually increasing space of the upper cone thoroughly impregnated.

The action of the air valves is steadied, due to the large annular vacuum chamber, reducing the flutter and causing the valves to open or close gradually, as the suction increases or decreases. The mixture is thus gradually rarefied according to the increased speed of the motor. The supplementary air dilutes the rich vapor issuing from the lower cone, and the pressure through this cone is decreased, causing less fuel to be drawn up. In this way the instrument automatically regulates the density of the vapor to correspond with the different motor speeds.

Electric Steel Works in Europe,

M. Pitaval has placed before the Société de l'Industrie Minérale of St. Etienne, France, a brief account of the different works in Europe that manufacture steel in the electric furnace. The list is as follows:

France.

Société Electrometallurgique Française, at La Praz; one 400-hp. Héroult furnace.

Société des Hauts Fourneaux et Forges d'Allevard, Allevard; two 500-hp. furnaces built, two building.

Société des Hauts Fourneaux, Forges et Acléries du Sant-du-Tarn, Saint-Juéry; one Héroult furnace building. Jacob Holtzer & Cie, Unieux; one Keller furnace.

Société Anonyme Electrometallurgique Ugine; one Glrod furnace.

Schneider & Cie, Creusot; one induction furnace.

Spain.

Viuda de Urigoita e Hija, Araya; one Kjellin furnace.

Germany.

Richard Lindenberg, Remscheid; two Héroult furnaces.

A. Krupp, Essen; one Gln furnace.

Roehling, Volklungen a. d. Saar; one Gln furnace.

Switzerland.

Allgemeine Calcium Carbide Gesell., Gurtellen; one Kjellin furnace.

George Fischer, Schaffhausen; one Héroult furnace building.

Italy.

Forni Termoelettrici Stassano, Turin; one Stassano furnace.

Arsenal of Turin, Turin; one Stassano furnace.

England.

Vickers, Sons & Maxim, Sheffield; one Kjellin furnace.

Sweden.

Aktiebolaget Héroult's Elektriska Stal Kortfors; one Héroult furnace.

Metallurgiska Patent Aktiebolaget Gysinge; one Kjellin furnace.

The Velte Foundry & Machine Company, Pittsburgh, Pa., has successfully started its side blow converter for small steel castings. The company expects to take up the manufacture of such converters in sizes from 1 to 5 tons capacity.

THE NATIONAL METAL TRADES CONVENTION.

Ninth Annual Meeting, Boston, Mass., March 21 and 22, 1907.

The ninth annual convention of the National Metal Trades Association, held at the Hotel Brunswick, Boston, March 21 and 22, was generally pronounced by the members present as the largest, most representative and most important in business transacted in the history of the organization. Many matters came up for consideration, and the action taken in a number of instances should exercise important influence upon the existence of the association and of the metal trades generally. Industrial education came in for a large share of discussion, the subject being brought forward in various forms and in several connections, emphasizing the importance attached to the subject. It was determined to revise the constitution, and a committee will be appointed for the purpose, which will hold meetings of which members will be informed, that they may be present if they desire and set forth their views on proposed changes, the final report of the committee to be submitted for an association vote. The growth in membership has been great during the past year, the total increase being 232, or 44 per cent., which is in itself a matter for much congratulation.

The social side of the convention was no unimportant one. The members of the Boston branch had seen to it that the members could not very well have a dull time during their leisure hours, and the banquet, complimentary to the visitors, was an occasion of much pleasure and entertainment. As hosts the Boston members shone as brightly as they do in matters pertaining to the business interests of the metal trades.

THURSDAY MORNING SESSION.

The opening session was held Thursday morning. President W. D. Sayle called the meeting to order, and there was an address of welcome by Mayor John F. Fitzgerald of Boston, who spoke thoughtfully on the general objects of such organizations, and told of the greatness of Boston, with its 600,000 of actual population, but its 5,000,000 people living within the hour's access of the city, this inclusion of population making it second in size only to New York. President O. P. Briggs of the National Founders' Association, and President J. W. Van Cleave of the National Association of Manufacturers, occupied seats of honor and made addresses.

President Sayle made his annual report, which was greeted with enthusiasm. He said:

Report of President Sayle.

I wish to congratulate the National Metal Trades Association upon its phenomenal growth during the past year, such growth being due entirely to the earnest work of the membership in establishing branch associations and thereby creating local sentiment in favor of the national organization. The evidence of this interest and loyalty of our membership is splendidly exhibited by the representative body which has enrolled itself as being present at this convention.

The past year has been a year of unequaled prosperity and productiveness, and while serious strikes have occurred in other lines on all sides of us we have been comparatively free from industrial turmoil. The only trouble that we have experienced has been in manufacturing centers where only recently interest in our work has been aroused and where only recently a branch association has been formed. This absence of widespread labor agitation at such a propitious time for the walking delegate is due, I can fairly say, to the moral influence of the greatest defensive organization there is in existence in the world to-day.

LOCAL ASSOCIATIONS.

The existence of this great defensive organization is due not only to the loyalty of individuals, but to the loyalty of the combination of individuals as evidenced by our local associations. We have in all now established 15 local associations, and I have found them to be earnest in their work and loyal in their duties. To the local secretaries too great praise cannot be given; they have rendered their assistance in every way possible, not only in the procuring of men through their labor departments, in the exigencies of strikes, but in disseminating the truths and underlying principles as promulgated and defined in our Declaration of Principles.

I wish to congratulate the association on the adoption of the scheme of branch associations, as I believe the branch associations are of great assistance to the national in the maintenance of industrial peace, and the National Association acting as the headquarters and clearing house for the branches makes it possible for them to keep in touch with the entire labor situation in all parts of the country. Without the National Association the locals could not hope to continue long as successful organizations, and without the locals the efficient work of the national would be somewhat curtailed.

I wish particularly to call your attention to the immense responsibilities of our organization, and in illustration will state that we have now employed upward of 65,000 operatives listed under the National Metal Trades schedule, from which can be reckoned, at a low average rate of \$2.50 per day, that we have a daily payroll of \$160,000. I feel sure that it is fair to me to presume from these figures that the National Metal Trades Association holds the adjustment of the future welfare of the metal trades within its counsel.

In justification of my statement, I will venture to state, without contradiction, that should the National Metal Trades Association, through its membership, decree that eight hours should constitute a full day of labor, or should adopt any other curtailment of employment, then every other manufacturer in the country would be compelled to abide by such decision. Could greater responsibility be placed on any association than that which you are called upon to assume?

UNION ACTIVITY IN LEGISLATION.

The activity of the union element has been much in evidence in our halls of legislation during the year, and it has been a severe tax upon our citizens to keep in touch with the many pernicious bills that have been placed for enactment, so that efficient steps could be taken to kill or at least shear them of their objectionable features.

It is a queer commentary on our legislators that they are ever ready to attach their names to, and lend their aid in placing before the bodies in which they are members, all of the pernicious and silly bills presented by union labor; while the member is hard to find who will have the courage to stand up before his colleagues and condemn what he knows to be wrong and a great injustice to the employing interests and to that great army of free and independent workmen who have not bartered their liberties to the walking delegate, who are known to all right thinking individuals as freemen, and whose numbers vastly exceed the number enrolled in labor organizations.

This state of affairs emphasizes the well known fact that the employer and the freeman must look out for their own interests, as the legislator whom they send to the State Legislature does not consider them at all, nor does he consider that their interests have any place in the hall of legislation. Should you criticize him for such an opinion? The labor representative places before him the usual arguments and misrepresentations pertaining to the conditions of labor and its employment. The manufacturer is busy seeking to satisfy the demands of business and to meet his financial obligations both as to material and labor, and for that reason has no time to spare. With all arguments in, how will the jury decide? The decision will undoubtedly go with the weight of testimony. We must therefore be awake to our interest and keep our organization compact and alert, if we wish to get our share of justice. For there is not justice without proper organization.

In conclusion, I desire to call the attention of the membership to our Declaration of Principles and to firmly impress upon your minds that the National Metal Trades Association is not primarily a fighting organization and that the greatest good performed by our association, as evidenced by the activity of our officers, is not, as would seem apparent, measured by the successful combating of unjust strikes, but is due more to the successful efforts of our officials in preventing strikes; their efforts being greatly encouraged by our membership and assisted by the knowledge that the National Metal Trades Association never undertakes to solve a problem until after all the facts of the same have been presented and carefully weighed. Judgment is then rendered and a line of action defined.

This I believe to be the only proper course to pursue, as it would be a very easy matter for a great association like our own, which has the strength to do what it wills, of allowing its strength to overbalance its judgment, thereby causing it to do and act contrarily to the right principle of justice. It is a common saying that "might is right." I therefore say to you, judging from the strength of our organization and its policies, that "might and right are doubly right." With this evidence of strength and fair dealing, I look to see our association increase in member-

ship and influence to such an extent that it will dominate to a full degree the manufacturing interests of this country.

The report of Treasurer William Lodge showed a most prosperous condition of the funds of the association.

The report of Acting Commissioner Robert Wuest, in part, follows:

Report of Acting Commissioner Wuest.

It is unfortunate that, in presenting a summary of this kind, it is not feasible to furnish a detailed account of the association's operations, since by so doing the members would more readily understand the value of their membership in an association which has acquired a worldwide reputation for its fairness and its ability to protect its members in labor controversies. That the National Metal Trades Association has come to stay is acknowledged, if for no other reason than that its members appreciate the fact that their commercial lives would be made a burden by some labor leaders were the association to go out of existence. I am confident that if it were possible for the employers in the building trades, for instance, to acquire such reputation as your association has achieved, they would gladly spend ten times the amount we have.

It is, therefore, fair to presume that with continued growth and success, your association's work will prove still more effective and very much less expensive in time to come, its mere existence being a good business proposition, since it causes leaders of labor to pause and reflect before calling strikes in the shops of its members. That any member should question the value of his membership because of his inability to observe an immediate benefit is inconceivable to those familiar with the practical workings of the association and its influence.

The past year has been the most strenuous in the history of the association, its officers having handled labor difficulties for 31 of its members, involving 2925 employees, at a cost amounting to approximately \$82,588.27.

I believe I am perfectly safe in asserting that it would have been wholly impossible for any one of the members who were involved to have successfully combated the difficulties themselves as economically or as expeditiously as was done by the association, and just here a statement made by A. E. Schaaf, general manager of the Pope (Toledo) Motor Car Company, to a prospective member, to the effect that he was convinced that, if his company had been willing to spend five times the amount it did, the same results could not have been obtained in the same length of time, should be of interest.

LOCAL BRANCH ASSOCIATIONS.

We have at this time local branch associations in the following cities: Chicago, Ill.; St. Louis, Mo.; Toledo, Ohio; Springfield, Mass.; Worcester, Mass.; Hartford, Conn.; Syracuse, N. Y.; Cleveland, Ohio; Pittsburgh, Pa.; Cincinnati, Ohio; Boston, Mass.; New Haven, Conn.; Indianapolis, Ind.; Buffalo, N. Y., and New York City. The value of these branches to their members, as also to the members of the association not affiliated with a branch, has been demonstrated to a considerable degree within the past year. The further increased efficiency of these branches which may be looked forward to is bound to render them of increasing service to the association and all its members. A comparison of their growth, in both membership and the number of operatives reported, should be of interest.

Following is the growth of membership of the various branches and of the operatives represented, the comparison being in each instance from before the merger with the National Association and March 1, 1907, the growth being shown in percentages:

	Increased membership.	Increased operatives.
Per cent.	Per cent.	
Cincinnati Branch, merged September, 1905..100		95
Chicago Branch, merged September 1, 1905..140		91
St. Louis Branch, merged September 1, 1905..169		172
Boston Branch, merged September 1, 1906..27		50
Buffalo Branch, merged March 1, 1906.....27		47
New York Branch, merged March 1, 1906...413		219
Cleveland Branch, merged June, 1906.....169		113
Toledo Branch, merged June, 1906.....114		160
Indianapolis Branch, merged June, 1906...316		864
Hartford Branch, merged September, 1906..300		431
New Haven Branch, merged September, '06..1,400		289
Springfield, Mass., Branch, merged November, 1906.....1,500		117
Pittsburgh Branch, merged December, 1906..950		644
Syracuse Branch, merged September, 1906..199		59
Worcester Branch, merged June, 1906.....380		141
Net gain in good standing during fiscal year.....261		
Total membership in good standing March 1.....755		
Total increase in membership.....232		
Per cent. increase in membership.....44		

In a number of cases demands were presented, but thanks to the advice given by your officers, the Executive Commit-

tees of local branches, and the prompt attention of the secretaries in charge of your local branches in which the cases occurred, the threatened difficulties were forestalled.

We are at this time conducting the defense of strikes in the following plants: The Shaw-Kendall Company, Toledo Machine & Tool Company, C. E. Sutton Company, Advance Machinery Company and Toledo Foundry & Machine Company, all of Toledo, Ohio; Woodward Iron Company, Woodward, Ala., and Gemmer Engine Company, Wabash, Ind.

GENERAL MATTERS.

Your secretary has in preparation a handbook covering the maximum and minimum rates of wages paid the different classes of operatives coming under the association's classification, based on the statistical reports received from the members. This handbook should be of great value to the members.

The membership will no doubt regret greatly to learn of the continued illness of their commissioner, W. P. Eagan, and from whom your acting commissioner received a telegram dated Pasadena, Cal., March 13, 1907, reading as follows: "Now located at Esperanza Sanitarium, Altadena, Cal.; feeling much better."

Regarding the *Open Shop*, it is truly unfortunate that our members do not fully appreciate the advantages which would accrue to themselves by having their employees read this publication, which has met with the approval of so many recognized authorities on the question of industrial economics. It would probably surprise many of our members if they were acquainted with the nature of the correspondence received as regards the efficiency of our publication's educational qualities. As a matter of illustrating the esteem in which this publication is held by high class manufacturing concerns, not members of the association, it will no doubt surprise and please the members to know that we have received within the past few weeks an annual subscription from a nonmember for 100 copies to be sent exclusively to the home addresses of its employees.

REGARDING THE OFFICERS.

Your acting commissioner, after being advised by your commissioner, W. P. Eagan, that his health had necessitated his return to the Southwest for an indefinite period, entered into an arrangement with J. V. Wright under which Mr. Wright took up the work of assisting your acting commissioner, July 18. It is with much pleasure that he is able to report that Mr. Wright's services have been very satisfactory. The Administrative Council at its October meeting, feeling that Mr. Wright could be enabled to render more effective service, bestowed upon him the title of assistant commissioner.

In conformity with the resolution of the Administrative Council, adopted at its October meeting, your acting commissioner concluded an arrangement with Nelson W. Dingwall of New York City under which Mr. Dingwall's services are retained as auditor for the association.

Your Administrative Council authorized this arrangement because it was felt that many members did not have a full understanding as to the class of operatives properly reportable under the classification of the association, and it was felt that Mr. Dingwall's services in advising concerning these matters would serve to obviate many future possible misunderstandings between the association and its members as to the cases in which the association might be called upon to render support. Subsequent experience has proved the wisdom of the appointment.

The following applications for membership are pending:

American Valve & Meter Company, Cincinnati.
 Bruce-Mariam-Abbot Company, Cleveland.
 Wm. Barker & Co., Cincinnati.
 Fairbanks-Morse Electrical Mfg. Company, Indianapolis.
 Flather & Co., Incorporated, Nashua, N. H.
 Garford Company, Elyria, Ohio.
 King Brothers, Chicago.
 Lewis Foundry & Machine Company, Pittsburgh.
 M. C. Lilley & Co., Columbus.
 Hugh Merrie, Cincinnati.
 Andrew Messmer Company, Cincinnati.
 Thomas J. Nichol & Co., Cincinnati.
 Wm. Powell & Co., Cincinnati.
 Queen City Brass & Iron Works, Cincinnati.
 Tabor Pump Company, Buffalo.
 E. W. Van Duzen Company, Cincinnati.
 Murdock Mfg. & Supply Company, Cincinnati.

Committee on Legislation.

John Kirby, Jr., Dayton, Ohio, made the report as chairman of the Committee on Legislation, stating, in part:

The Committee on Legislation appointed by your Administrative Council a year ago begs leave to report that there have been no matters relating to legislation referred to it during the year, nor has any question been brought to its attention requiring action. The object in appointing the

committee was that this association might have a proper committee to which it could refer any communication from any other similar organization touching upon legislative matters and looking to the establishing of a general national committee on legislation composed of committees from the various national organizations of employers and citizens working along the lines of bettering the industrial conditions of the country.

The desirability of such a national committee or council to look after the matter of legislation inimical not only to the interests of employers of labor but also to the general good and prosperity of the country is more and more emphasized every day by the fact that labor bills, many of which are unreasonable and unjust, are constantly being introduced in the various State legislatures throughout the country, all emanating from the legal department of the American Federation of Labor and systematically introduced and followed up by the labor agitators in all States.

Mr. Kirby read extracts from a few such bills to illustrate his point, and continued:

The extracts quoted represent but a small portion of proposed legislation which the labor agitators and leaders are systematically and persistently striving to foist upon the people of this country, and which in many cases they have been successful, while in many other cases they will be successful, if the present indifferent attitude of manufacturers and other employers is maintained. The titles of most of such bills are very deceptive and do not indicate the pith of the bills themselves, thereby catching the unwary legislator and receiving votes which in many instances fairly disposed legislators would withhold were they to scrutinize the bills as they should do before voting upon them, and which to do is the exception rather than the rule.

Then, too, the advocates of such bills will always have their representatives on the ground urging their passage, and, unless they are opposed at least as vigorously as they are urged, they are most certain to become laws, and our representatives will tell us that they voted for them because there was no opposition to the measures and they thought they were, therefore, justified in doing so.

In view of these facts, the employing interests of the country should have one central department made up of representatives from the various national organizations and devoted to the work of gathering data with respect to proposed labor legislation, together with copies of such bills, and transmitting the same to the secretaries of local organizations or influential business men in the States where such bills are pending, and in a general way arousing to action the parties interested in defeating the same; also to attend to the framing and introduction of bills needful for the protection of employers and employees alike in their right to pursue their legitimate occupations under such specific laws as shall leave no loopholes for organized labor to pursue the policy adopted by Shea and his cohorts in the teamsters' strike at Chicago and then go "scot free."

Such a department has already been advocated by the president and considered by the directors of the National Association of Manufacturers, and the plan contemplated is to form an employers' council, constituting delegates or officers of the various national organizations having in view the special work of looking after the matters referred to, and in addition thereto general legal work appertaining to bringing the leaders of the labor trust before the bar of justice under the antitrust laws of the Federal Government and the various States, the time for which is fast approaching, and the work should be taken in hand with as little delay as possible by the best legal talent of the country, and with a determination to land behind the bars those daring and barefaced violators of law who represent the labor trust, compared with which the greatest capital trust is a mere nothing.

J. H. Schwacke, Philadelphia, told of the experience of the Philadelphia branch in sending a delegation of 30 members to Harrisburg to fight proposed legislation which would be unfair to industrial interests.

E. F. Du Brul, Cincinnati, moved the acceptance of the report, with the recommendation to the Executive Council that it carry out the provisions as set forth. Mr. Du Brul told of the effort made by manufacturers of Cincinnati, backed by others from Cleveland and Dayton, in fighting labor legislation in Ohio. He urged the establishment of a central bureau, where this and similar associations could get all necessary information as to proposed or enacted legislation of this sort in all the States of the Union. The motion was carried.

The Committee on the Co-operation of the National Metal Trades' Association and the National Founders' Association was not ready to make its report, no meeting having been held because of the enforced absence in Europe of W. H. Pfahler, Philadelphia, chairman of the joint committee of the Founders' Association. M. H.

Barker, in announcing the condition of this proposed plan of co-operation, stated that he had heard from Mr. Pfahler that he would soon return to America and that the meeting of the joint committee would be held in the near future.

THURSDAY AFTERNOON SESSION.

Committee on Education's Report.

At the afternoon session William Lodge made the report for the Committee on Education. He dwelt upon the exceedingly great importance of trade schools, and cited the instance of the Winona Technical Institute, Indianapolis, a school where all American boys, regardless of class, may be taught a trade. It has been demonstrated that boys can learn a trade in a very short time under special, competent instruction, and that they can go to fill places where they are badly needed at the present time much earlier than if they are trained under the usual shop apprentice system. The Winona Institute has demonstrated that it can turn out in a very short time a molder who can satisfactorily fill the place of a journeyman. Mr. Lodge said:

"We hope that a similar plan can be carried out in Cincinnati. We hope that every large city in the United States will be able to do likewise, for we believe that if we are to continue our present prosperity, and if we are to have the country compete successfully for the trade of the world, we should be giving to the American boy such a training that he may go on as rapidly as his ability will permit. We believe that it is the duty of members of this association to give most careful consideration to this branch of trade school work."

THE WINONA INSTITUTE.

Mr. Lodge went on to describe the Winona Institute, its lands and buildings, and referred to the willingness of machine tool manufacturers to supply the necessary equipment for a department to train machinists along the same lines as the department for molders, and those for other branches of trade. W. M. Taylor and Mr. Lodge had been appointed a committee to look into this matter. They found that a building will be furnished by the institute, admirably adapted for the purpose. The structure has been damaged by fire, and the insurance money, \$15,000, has been set aside as a fund to make the necessary repairs. Probably some \$5,000 will be left for use in buying necessary equipment. Motors will be needed, for the operation of which the institute has plenty of power. The machine tool manufacturers would give the equipment. The question is the supply of boys, for which purpose a fund of \$3,000 will be necessary. The institute is desirous that the National Metal Trades Association should take a hand in this department. If it should decide to act in the matter, the association would have complete control of the work of the department, the instructors for which would be furnished by the institute.

W. M. Taylor, Indianapolis, the other member of the committee, went more into detail regarding the work of the institute. He cited the instance of the course in tile setting, a trade in which the apprentice restrictions imposed by the union are so rigid that they have resulted in a serious scarcity of this class of labor, so that the daily wage for eight hours is \$6, and the boys who leave the institute will graduate into that wage. The institute is well furnished with instructors, with light, heat, power, &c. If the association will donate equipment, and either as an association or as individuals provide 30 scholarships of \$100 each, for four years, the money will be held as a fund which will be loaned to the boys, from whom notes will be taken payable in five years without interest. They are supposed to pay back this money after graduation. Some loss is expected, for it is only a gentleman's agreement and one that cannot be enforced as it is a contract with a minor. Nevertheless, the loss so far has been only about 20 per cent., and \$2,000 has been paid back to be loaned to other boys.

Herbert H. Rice, Pope Motor Car Company, Indianapolis, described the plant and its opportunities, and told something of the success which the National Founders' Association had achieved in its school for molders.

E. F. Du Brul, Cincinnati, compared the trade educa-

tion in the United States with that of Germany, where every small city has a trade school, and stated that if the facilities in this country were equal to those of Germany every city of 30,000 inhabitants would have a trade school, and those of larger cities would have schools for the teaching of many trades. We know what German industry is in our competition abroad and in this country, and the foundation of their success lies in their 40 years of trade schools. We realize that the apprentice system has broken down. Foremen are not necessarily instructors; they are usually too busy in getting out work to be able to devote the necessary time to the training of boys. Mr. Du Brul strongly advocated the spending of money for this purpose.

J. C. Hobart, Cincinnati, agreed to the general principles laid down by other speakers, but wished that reference had been general rather than specific. He thought that those who were to get the benefit of such a school should furnish the money.

President O. P. Briggs of the National Founders' Association went into some details of that association's experience in the Institute, which has been thoroughly satisfactory.

Fred A. Geler, Cincinnati, spoke strongly in favor of the general project. He pointed out that the association had reached the point where it should take up important matters such as this. Industrial education is all important. In solving the great problem of labor it is necessary to get at the root of the trouble. Industrial education has been neglected in this country. It is time the National Association takes up the question and assumes some responsibility in it.

It was finally voted to leave the question of co-operating in the Institute to the discretion of the Administrative Council.

The Banquet.

The great hall of the Brunswick was crowded during the complimentary banquet given by the members of the Boston branch, Thursday evening. It was a great and representative gathering from all parts of the United States and Canada. A. E. Cox, Atlantic Works, East Boston, was the toastmaster, and excelled in the duties of his office. The after-dinner speakers were Lieut.-Gov. Eben S. Draper of Massachusetts, who brought the greetings of the Commonwealth; Herbert Parker, former Attorney General of Massachusetts; President J. W. Van Cleave, and Samuel J. Elder, a famous Boston lawyer.

FRIDAY MORNING'S SESSION.

Much of the Friday morning's session was given over to the reading of papers. Congressman William C. Lovering, president of the Contractors' Mutual Liability Insurance Company, read a paper on "Employers' Liability Insurance," in which he made a strong argument for mutual insurance as more economical than insurance in a stock company.

Samuel F. Hubbard, Boston, read a most interesting paper on

The Commercial Value of an Industrial Education,

in which he said:

There was a time when the commercial value of industrial education was on trial whether or not it could contribute anything to the scientific knowledge and industrial training required in the productive industries beyond that which could be acquired in the shop. There is still an echo of the old assertion, "The only place to learn a trade is in the shop." Germany, poor in natural resources, but rich in her thousands of trade schools, whereby goods labeled "Made in Germany" are found in every port, is the classical example adduced to show that special industrial schools have a distinct economic value. Nobody who has given more than a passing thought to it denies that industrial education does have a positive commercial value.

HOW SHALL TRADE SCHOOLS BE ESTABLISHED?

The paramount question in industrial education to-day is not as to its value in contributing trained intelligence to the productive industries but how, in what way, shall trade schools be established. Several ways suggest themselves. They may be started:

1. By the State working in conjunction with municipalities.

2. By the State co-operating with employers, either singly or collectively.

3. By philanthropists.

4. By employers themselves.

The first method here suggested has been accepted by Massachusetts. Two years ago a temporary commission was appointed by act of the Legislature to report on industrial education. On the basis of that report it was enacted that the Governor should appoint five persons to serve as a Commission on Industrial and Technical Education with power to establish trade schools under certain conditions. By this act the State definitely recognizes that industrial education, by means of trade schools, is as legitimately a part of the public school system as the education given by the grammar or high school. Indeed, admitting the fundamental principles on which our common schools are based, it is difficult to show why this is not a logical sequence.

STATE CO-OPERATION WITH EMPLOYERS.

A second method of establishing trade schools is by the State co-operating with employers, either singly or collectively. In my judgment the Massachusetts law would have been much more effective if the commission had been allowed to deal directly with the manufacturers rather than through the municipal authorities.

The trade school idea is a matter of education. It can never be made efficient without the enthusiastic co-operation of all concerned. The inertia of indifference to trade schools on the part of employers must be overcome by showing them their value. A trade school propaganda is necessary, as it is useless to provide anything, however beneficent, if nobody wants it. A State commission, by virtue of its larger opportunity for knowledge, can be that propaganda, and can stimulate, advise, suggest and give material assistance to those who must ever be an important factor in the conduct of any trade school, namely, the employer.

To make it necessary that the municipal council shall be educated up to the point of voting funds for the establishment of trade schools, with all the difficulties attendant upon such education, before anything can be done, is, I believe, to unduly hamper the commission in its work, especially when public spirited manufacturers stand ready to share with the State the expense of such schools and to assume the lion's share of the responsibilities involved in their administration.

Another method of establishing trade schools is by private philanthropy. This is easy, so far as the financial end is concerned, if one can get the philanthropist. It is assumed that all trade schools started by such methods will require the co-operation and help of the best representative employers of the several trades taught. Boston is anticipating the establishment of a trade school under the terms of a will, whereby several million dollars have been given for the purpose of trade training.

SCHOOLS ORGANIZED BY EMPLOYERS.

Again, trade schools may be organized by employers. Indeed, there are those who urge that they are the only proper persons to take the initiative in establishing and administering such schools, especially until such time as the State shall realize its obligation to share this service. The manufacturers know better than any one else how important a factor industrial intelligence is in production, and they, above all others, are most competent to inaugurate a systematic method of trade training.

American manufacturers show a wonderful power of organization, are keen and alert to discover new processes and methods, do not hesitate to spend thousands upon improved machinery, and the marvel is that, with all this mental grasp and clearness of vision, they have not as yet demonstrated beyond question the economic possibilities of industrial education. I do not believe it is necessary for the manufacturers of the United States to wait until the State or the philanthropic angel steps in and troubles the waters before they may assume to take the initiative in the establishment of trade schools.

SPECIALIZATION COMPLICATES THE PROBLEM.

The problem of trade training is made more complex by the system of specialization in the means of production. This system has been carried so far with us that it is known as the "American plan." It is unquestionably true that even a limited intelligence can be focalized to a single process so that the output will be greater in quantity and better in quality than can be secured by distributing a higher intelligence over a wider range of processes.

Naturally, the time required to learn one process is much less than is needed to learn several, and a boy becomes a productive unit just that much sooner. The system of specialization seems to indicate that a relatively inferior boy can be so trained by this method that he may become a better economic investment for the employer than one trained by a system which aims to give a broader and more general instruction.

No one denies the economic value of a highly specialized system of production, but is there not a danger that so much emphasis may be placed upon this method as to eliminate,

so far as shop opportunity is concerned, the all round workman in favor of the specialist, skilled in one thing, and thereby imperil the ultimate welfare of the productive industries?

SPECIALIZING IN APPRENTICESHIPS.

There appeared recently an editorial in a leading trade paper* on "Specializing in Apprenticeships." It indicated that the large machine shops of the country are beginning to carry the idea of specialization even to apprenticeships; that by this method the amount of training needed by workmen could be reduced to the lowest terms with direct advantage to the employer. In order to get a comprehensive idea of the effect of such a system on the productive industries, a copy of the editorial, together with half a dozen questions, was sent to several large manufacturers in the metal trades. Obviously, it is impossible for me to give more than a hint as to the nature of the replies. All were agreed that beginners from 16 to 20 years of age should not specialize narrowly in learning a mechanical process. There was a unanimous opinion that a certain number of all round workmen are needed in the manufacture of machine products, the approximate number varying from 10 to 50 per cent. of all employed. Some were positive that the system of high specialization is inconsistent with encouragement to aspiration on the part of bright men, others were equally emphatic in their dissent from this conclusion. I am inclined to think this difference of opinion is due to the different points of view. All were of the opinion that the demand for broadly trained workmen is increasing.

I quote one reply in full: "Perhaps there never has been a time in history when the value of a broad training to the workman has been so keenly felt as at the present day. It has been proved by statistics that the countries that have provided most liberally for the training of the workman are making the most rapid advances in manufacturing. This training, we believe, should be given in properly equipped manual and trade schools, training the mind as well as the hand."

The response to the question whether specialization does or does not result in making of the workman an "animate tool" is practically summed up in one reply, which I quote: "Any workman lacking ambition or energy can become any, if little, better than a machine operator."

A BROAD INDUSTRIAL TRAINING NEEDED.

These replies point decisively to the conclusion that it is desirable that bright young men should have at the outset a broad industrial training, that a certain number of all round workmen are needed in every industry and that the demand for such is increasing.

In view of the difficulty which obtains in many shops, of giving this thorough systematic training, the trade school seems imperative. It is held that a school properly equipped, having a well planned course of instruction under the personal guidance of competent instructors, can lay a better foundation for the future workman and do it in a much shorter time than can be done in any other way. Such a school, in my opinion, should not be independent of the shop but supplementary to it. The school has its limitation in trade training as well as the shop, each being necessary to the other.

In this connection let me note one or two conclusions which Prof. Paul H. Hanus, chairman of the Massachusetts Commission on Industrial and Technical Education, has reached. I quote from a public address. After emphasizing the need of industrial schools to supplement the existing public schools, he says:

"Such schools would receive pupils 14 to 15 years of age who declare their intention to learn a trade, and would therefore be parallel to the existing high schools, but independent of them. Such schools must be independent schools, because the motive and end for which they exist, namely, vocational training, as contrasted with the general training of the existing public schools, determines the value of the instruction in every detail. Such schools would offer a course of study covering four years. The first two years would comprise general shop instruction with related drawing, mathematics, natural science, the history of industry and commerce, shop and business English, and the reading of appropriate articles and books. The last two years would give shop instruction for particular trades, and, for each trade represented, the drawing, mathematics, physics, chemistry of that trade, the history of that trade, treated both as special history and as a branch of general history, civics treated as concretely as possible, and English as before."

CHANGES IN ACADEMIC METHODS.

This programme suggests that industrial education may eventually cause radical changes in the academic methods which now obtain in our public schools, as well as a change in the attitude of the schoolmaster toward trades as a vocation.

Fifty years ago Ralph Waldo Emerson charged popular education with a want of truth and nature. He complained

that an education to do things was not given. He saw that literature, far from being the only factor in civilization, was not even the chief one. He said: "We are students of words! We are shut up in schools and colleges and recitation rooms from 10 to 15 years, and come out at last with a bag of wind, a memory of words and do not know a thing. We cannot use our hands or legs or our eyes or our arms."

It is a growing conviction, I believe, that this broad trade training is better assured by having an apprenticeship indenture than without it. Stripped of all legal phraseology, an apprenticeship indenture is simply an agreement between two persons to perform certain acts which are of mutual advantage; that is, to teach and to be taught during a fixed time. The indenture guarantees to the boy an opportunity to learn his trade as a whole, or such part of it as may be agreed upon, a fixed wage, and a steady increase during his term of apprenticeship; it guarantees to the employer continuous service on the part of the boy during a definite time, and a more faithful performance of his work because the boy realizes that his interests are bound up with his employer's.

This arrangement seems so eminently desirable on the part of each, and so mutually beneficial, that it is difficult to understand why the system of indentured apprenticeship is condemned in no unsparing terms or relegated to the scrap heap as obsolete. It should be said that these adverse criticisms come from people who know the least about it and never from the thoughtful employer. True, the employer may have personal reasons for not adopting the apprenticeship system, but it is not because he considers the system conducive to "slavery" or that it is "un-American." I believe a system of indentures will facilitate the work of a trade school. It is with much satisfaction that I find this association is formally on record in saying, "A proper apprenticeship system is essential to the education and perpetuation of skilled mechanics."

J. W. Van Cleave, president of the National Manufacturers' Association, read an able address, in which he made pointed arguments in favor of organized co-operation between the various organizations of employers, and emphasized the value of a campaign of education in bringing about the solution of present labor difficulties. He dwelt upon the possibilities existing in the newly created Industrial Peace Committee established by Congress, providing the right men are chosen for its members.

A paper of A. J. Allen, secretary of the Indianapolis branch, on "The Benefits of Organization," was not considered for lack of time, but will be published in full in the *Open Shop*.

The report of the Finance Committee was made by John Kirby, Jr., and its recommendations were accepted with much applause and enthusiasm.

Discussion followed as to the best method of proceeding in securing important changes in the constitution. It was finally voted that the Administrative Council be empowered to appoint a committee to revise the constitution, the committee to meet at some stated time when members of the association shall be invited to be present and express their views on the various questions involved.

The following resolution, presented by C. S. Bonsall, chairman of the Committee on Constitution and By-Laws, was accepted:

Resolved, That the Committee on Constitution and By-Laws be and it is hereby instructed to report amendments to the constitution as follows:

1. In order to secure the broadest representation in the Administrative Council, not more than one councillor shall be elected each year to succeed himself.

2. In order to secure closer relationship between the branch associations, the districts and the commissioners' office, it shall be the duty of the secretary to inform the members of the Administrative Council, the chairmen of the district committees and the presidents of the local branches of all important matters on which action shall have been taken.

Further Resolved, That pending the action of the Committee on Constitution and By-Laws this convention instructs the present nominating committee and the secretary to be governed by the spirit of these resolutions.

The report of the Committee on Nomination of Officers, consisting of the three ex-presidents which the association has had—G. F. Steedman, H. N. Covell and J. W. Gardner—was made by Mr. Steedman, and the report was adopted by unanimous vote, the following officers being elected:

President, M. H. Barker, American Tool & Machine Company, Boston.

First vice-president, F. K. Copeland, Sullivan Machinery Company, Chicago.

Second vice-president, O. B. Kinnard, Kinnard-Haines Company, Minneapolis, Minn.

* See *The Iron Age*, February 7, 1907, page 423.

Treasurer, William Lodge, Lodge & Shipley Machine Tool Company, Cincinnati.

Councillors, for term of two years: C. Bermingham, Canadian Locomotive Company, Limited, Kingston, Ont.; J. Phillip Bird, Hobbs Mfg. Company, Worcester, Mass.; M. K. Bowman, James Reilly Supply & Repair Company, New York; P. B. Kendig, Seneca Falls Mfg. Company, Seneca Falls, N. Y.

President Barker was called to the chair and made appropriate remarks, expressing his appreciation of the honor conferred upon him, and in turn each of the other newly elected officers were escorted to the platform and spoke briefly. After a few further formalities the convention adjourned.

The following committees served through the convention:

CONVENTION.—O. B. Kinnard, Kinnard-Haines Company, Minneapolis; J. H. Webster, Variety Iron Works Company, Cleveland; F. D. Wanning, Birmingham Iron Foundry, Derby, Conn.; J. P. Bird, Hobbs Mfg. Company, Worcester, Mass.; E. C. Henn, National Acme Mfg. Company, Cleveland.

WAYS AND MEANS.—F. C. Caldwell, H. W. Caldwell & Sons Company, Chicago; W. S. Hallowell, Harrison Safety Boiler Works, Philadelphia; S. P. Egan, J. A. Fay & Egan Company, Cincinnati; D. B. Kirk, C. & G. Cooper Company, Mt. Vernon, Ohio; J. C. Hobart, Triumph Electric Company, Cincinnati.

AUDITING.—A. H. Bullard, Bullard Machine & Tool Company, Bridgeport, Conn.; Walter Medart, Medart Patent Pulley Company, St. Louis; F. Macomb Cresson, Geo. V. Cresson Company, Philadelphia.

CONSTITUTIONAL AMENDMENTS.—C. S. Bonsall, Buckeye Engine Company, Salem, Ohio; E. E. Hanna, Hanna Engineering Company, Chicago; Jos. Reid, Reid Gas Engine Company, Oil City, Pa.; J. Kirby, Jr., Dayton Mfg. Company, Dayton, Ohio.

HOURS AND WAGES.—A. B. See, A. B. See Electric Elevator Company, New York; H. H. Latham, Latham Machinery Company, Chicago; Geo. W. Jackman, Springfield Mfg. Company, Bridgeport, Conn.

STRIKES AND LOCKOUTS.—William Kehoe, Wm. Kehoe & Sons, Savannah, Ga.; Julius C. Day, Whitlock Printing Press Mfg. Company, Derby, Conn.; Geo. W. Watts, Canada Foundry Company, Toronto, Canada.

NOMINATING.—H. N. Covell, Lidgerwood Mfg. Company, Brooklyn; J. W. Gardner, Gardner Governor Company, Quincy, Ill.; G. F. Steedman, Curtis & Co. Mfg. Company, St. Louis, Mo.

At the adjournment of the convention the Administrative Council held a session. W. P. Eagan was re-elected commissioner, and Robert Wuest, acting commissioner, which means an unchanged *personnel* of the home office at Cincinnati. The district committees were not announced, because of changes which will undoubtedly result from the new constitution. No decision was reached as to the place of the next annual convention.

Notes.

A number of the large manufacturing establishments of Boston and vicinity threw open their doors to the visitors, which resulted in several pleasant excursions. Notable was that of Friday afternoon to the works of the General Electric Company, Lynn, Mass. Other companies which extended this courtesy were the American Tool & Machine Works, Hyde Park; Becker-Brainard Milling Machine Company, Hyde Park; B. F. Sturtevant Company, Hyde Park; George Lawley & Sons Corporation, South Boston; Thomas G. Plant Company, Roxbury; United Shoe Machinery Company, Beverly, Mass.; Saco & Pettee Machine Shops, Newton Upper Falls; Brown & Sharpe Mfg. Company, Providence; Norton Grinding Company, Worcester; Prentice Bros. Company, Worcester; Putnam Machine Company, Fitchburg; Waltham Watch Company, Waltham.

The ladies were not forgotten in the hospitality. A dinner in their honor was given Thursday afternoon at the Hotel Vendome. There was a reception at 3.30 o'clock, followed by a dinner at 4 o'clock. In the evening the ladies were given a theater party.

The Western Union Telegraph Company and the New England Telegraph & Telephone Company tendered the association and its members free service to all parts of the country during the convention, and many visitors availed themselves of the privilege of talking to friends in distant cities.

The Alumni Dinner.

The usual alumni dinner was held at the Brunswick, Wednesday night, the eve of the convention. The alumni

consist of ex-members of the Administrative Council, who meet in fraternal gathering with the present members. J. W. Gardner was the toastmaster, and speaking was general, every one being called upon to say something. F. A. Geier gave a most interesting and entertaining description of his recent visit to Panama, and expressed the greatest satisfaction at the splendid work that is in progress there. He termed it a magnificent illustration of what Americans can do. The work on the canal is consistent in its method and energy with the best equipped and managed machine shops he had ever visited. H. N. Covell spoke of the fine record that President W. D. Sayle has made for himself and the association, and of the exceptional work which Secretary and Acting Commissioner Robert Wuest has accomplished during the past year, a work in which not only executive and business skill has been shown, but also the highest class of personal and moral courage in dealing with the difficult situations which he has been called upon to remedy.

A pleasant feature of the evening was the presentation to President Sayle of a beautiful diamond scarf pin, the gift of the alumni and ex-officers. A telegram of sympathy and good fellowship was sent to Commissioner Eagan.

Those present at the dinner were J. W. Gardner, W. D. Sayle, Robert Wuest, William Lodge, Walter N. Pierce, George W. Watts, Cornelius Bermingham, William Taylor, F. A. Geier, G. F. Steedman, F. H. Stillman, O. B. Kinnard, G. K. Garvin, O. P. Briggs, J. H. Schwacke, M. H. Barker, P. B. Kendig, A. H. Bullard, Nathan B. Payne, John Kirby, Jr., Howard P. Eells and H. N. Covell.

Foundry Cost Investigation.

Kenneth Falconer, 224 St. James street, Montreal, Que., chairman of the American Foundrymen's Association's Committee on Costs, is sending a circular to the membership for data on the practice generally followed regarding foundry costs. The following questions are asked:

1. When making estimates for selling purposes do you figure on
 - (a) Average cost per pound?
 - (b) Cost of metal, core making and molding separately?
2. Do you
 - (a) Regularly and continuously operate a system of foundry cost keeping?
 - (b) Do you simply make up the cost of particular or occasional castings, or lots of castings?
3. Do you figure the cost of your foundry output
 - (a) Weekly?
 - (b) Monthly?
 - (c) Yearly?
4. Do you pay for molding
 - (a) By day wage?
 - (b) By piece work?
 - (c) By any other system than by day or piece work?
5. Do you pay for core making
 - (a) By day wage?
 - (b) By piece work?
 - (c) By any other system than by day or piece work?
6. Is the time of molders
 - (a) Kept by order numbers?
 - (b) By themselves or by a time clerk?
7. Is the time of core makers
 - (a) Kept by order numbers?
 - (b) By themselves or by a time clerk?
8. On what basis do you distribute the cost of superintendence and other general items on the cost of castings?

The report of the committee will be presented at the Philadelphia convention of the association, May 20-24.

A party of 125 students and several professors of the mechanical and engineering departments of the Wisconsin State University left Madison March 22 for a 10 days' trip to Niagara Falls, Dunkirk, N. Y., and Pittsburgh, Pa. The trip is being taken as a part of the education of the students, who will receive practical lessons in the application of electrical power and engineering, as shown at Niagara Falls and at the manufacturing plants of Dunkirk and Pittsburgh.

The March meeting of the Engineers' Society of Milwaukee was held at the Plankinton House, March 20, the subject discussed being "Motor Drives."

Trade Conditions in Canada.

TORONTO, March 23, 1907.—In this country, as in the United States, business men are keeping a sharp lookout for signs of a reaction in trade. Several conditions have long been marked as dangerous and it is upon these that particular attention is fixed. In the addresses delivered at the annual meetings of the leading banks, the needs of these institutions have been uttering warnings for some years against the risks of overconfidence, speculation, extension of credit, crop failure, labor shortage and extravagance. The precautions suggested by these financial leaders were and are no doubt taken by conservative traders. But there is reason to believe that such counsels were more heeded three or four years ago than they are now. Often repeated they have become familiar, and the constantly rising prosperity has put them into some discredit. Never before has Canadians' faith in their country been so strong and general as it is now. They have enthusiasm at least equal to their faith, and possibilities that may be the actualities of the next generation are looked upon as the certainties of to-morrow. If there has been any subsidence of the fever of speculation it has not been owing to any decline in the buoyancy in the spirits of the people.

Money Stringency.

A condition that is making itself felt both in legitimate trade and speculative activity is the tightness of money. Manufacturers that could get all the funds they wanted a year ago are now rather sparingly supplied by their bankers. This is significant of two changes: first, a real scarcity of money; second, greater conservatism on the part of the banks. To note the latter point first, it may be said that the banks have become more careful since the failure of the Ontario Bank and the incipient agitation for greater public control over such institutions. There is reason to believe that some of the chartered banks themselves took chances that they would not have ventured upon at the beginning of the century. That the supply of money available for commercial purposes is inadequate is in part due to the expansion of trade and in part to the tying up of funds. The speculators are responsible for much of this tying up, but not for all of it. The money they pay for their Western lands or their Cobalt mining shares almost at once returns to circulation, unless when it leaves the country in the pockets of foreigners. And, so far as foreigners are concerned, they contribute more than they take away. If Minneapolis and St. Paul operators make big hauls upon lands in the Canadian Northwest the tens of thousands of forehanded men who leave farms in the Western States to establish homesteads in our prairie provinces add greatly to the country's wealth. Similarly, while the mines of the Cobalt region have made millions of a few Americans, many Canadians have made fortunes through the sale of Cobalt mining stocks of doubtful value to thrifty people in the United States. It is unquestionable, however, that money which, deposited in banks, was formerly at the disposal of commerce now passes back and forth among mining speculators.

Money Held in the West.

There is a perceptible, though perhaps but temporary, retardation of trade resulting from the suspension of the grain movement since last fall. The railroad companies signally failed to get the grain forwarded from the prairie fields to the head of the lakes before the close of navigation. A very large portion of the crop was thus left on the other side of the lakes throughout the winter. It has often happened before that the railroads were unable to get the whole crop into the hands of the lake carriers before the departure of the last vessels, but never before was the quantity left behind so great. In former winters, too, the Canadian Pacific Railway handled large quantities on its all-rail route. This winter, however, the difficulties of transportation were unusually great, and little grain came by way of the north shore line. The all-winter detention of 30,000,000 or 40,000,000 bushels of wheat in the Canadian West

is something of an obstruction to trade. If such of this wheat as is still in the hands of the farmers had been realized upon in the autumn the bills of local merchants would have been paid, and in turn the wholesale merchants and manufacturers in the Eastern cities would have got their money, and the banks would not now be worrying some wholesalers and scanting some manufacturers. Such of the stranded wheat as is in the hands of grain buyers is also for the time commercially inert. Until it is delivered in Liverpool or whatever other port it may be destined for it cannot make exchange, and the money in it is literally tied up. This Western grain situation affects not only actual business, but also sentiment. The marked decline in the earnings of the Canadian Pacific Railway on account of the obstacles in traffic, and the great loss of cattle on the ranges owing to the severity of the weather, are also influences which for the moment make for caution. Until the grain movement begins with the opening of navigation the outlook will lack some of its wonted cheerfulness.

Of course, the basis of Canada's prosperity is its farm production. A bad crop in the West would cause more of a setback than probably any untoward conditions in other departments of industry would make. The crops of 1907 are an unknown quantity, but that faith in the country to which reference has already been made, is growing abroad as well as at home. Immigrants are this year to swarm into the country in greater numbers than ever, and the United States is counted on to send as large a contingent as it sent last year. It is estimated by the Interior Department that Canada will this year add 300,000 immigrants to its population.

Railroad Building.

Probably not less than 3000 miles of railroad lines will be laid this year in Canada, and there are certain to be large annual additions to the railroad mileage for years to come. Excessive capitalization or contractions of the money market are not so likely to discourage railroad building here as in the United States. The construction of the National Transcontinental Railway is largely a function of the national credit. The division from Moncton to Winnipeg is being built and is to be owned by the Dominion Government, though operated under lease by the Grand Trunk Pacific Railway Company. The division from Winnipeg to the Pacific, while it is being built by the company and is to be the company's property, is aided by the Dominion Government's bond guarantee. The Canadian Pacific Railway Company, which adds hundreds of miles to its branch lines every year, has for that purpose immense assets, constantly increasing in value, in the form of land grants from the Government. The Canadian Northern has also large land subsidies, and the bonds of nearly every line it builds are guaranteed by the province such line traverses. Mr. Emerson, Minister of Railways and Canals, stated in the House of Commons yesterday that he believed the time to be not far distant when the Intercolonial would be extended to Toronto. The Ontario Government has under consideration new extensions of its Temiskaming line, which is to join the National Transcontinental near Lake Abitibi. Where the Government so largely supplies the capital, as it does in the cases of all the lines mentioned, there is small danger of railroad building being arrested by money troubles.

The Mining Industry.

According to reports of the Geological Survey of Canada and of the Ontario Bureau of Mines, there is enough good ore in the Cobalt field to maintain a mining industry there for years. As the country fills up the impulse to the mining of the useful metals, especially iron, will keep on increasing. Metallurgical industries are already springing up here and there. Water powers are being developed, electric railroads built, and electric machinery of all kinds is being installed. All these things, originators of trade in themselves, are nourishers of other industries and trades in their locality.

In few words, the present is Canada's growing time. The expanding and filling out processes will make and maintain business here when there is depression in full grown and matured countries.

C. A. C. J.

The Red Iron Ores of Birmingham.

Since 1894 Alabama has held third place among the iron mining States. As the Birmingham District in 1905 produced 2,561,264 tons of red hematite, or 86.7 per cent. of the total tonnage of the State, particular interest attaches to a study of the Clinton or red ores of the district, which Ernest F. Burchard of the United States Geological Survey carried on last summer. By the Birmingham District is meant the area from which the furnaces at Birmingham, Ensley and Bessemer derive their iron ores.

The city of Birmingham and its suburbs are built in the heart of the valley region of Alabama. This valley region lies between the Cahaba coal field on the southeast and the Warrior coal field on the northwest. Its rectilinear ridge and valley type of topography is strongly contrasted with the irregular, roughly dissected topography of the coal fields.

The Birmingham Valley,

the largest and, from an industrial standpoint, the most important of these valleys, has a length of nearly 75 miles, an average width of more than 6 miles, and an area of nearly 500 square miles. This valley is divided into minor valleys by low ridges.

Red Mountain, the main minor ridge within the Birmingham Valley, furnishes nearly all the red ore smelted in the district, while the Woodstock area, in the southwest part of the valley, produces the major part of the brown ore. Coking coal is mined in the Warrior coal field only a few miles distant from the furnaces. Dolomite and limestone suitable for fluxing occur in the valley rocks below and above the red ore. Only in the southern Appalachian iron ore district is there grouped such a series of deposits, each member of which is more or less dependent upon the others, but which, when taken together, form such a matchless combination of raw materials. The simple, regular, topographic features of the valley have made accessible the ores and stone at every point where they are of workable character, and enterprising railroad companies have fast improved the opportunities for developing the region. The only serious problem involved by the valley topography is that of obtaining a water supply adequate for manufacturing purposes. That there will be no difficulty about this, if another large aqueduct is built from Cahaba River, is assured.

Red ore occurs in practically all the outcrop areas of the Rockwood formation, but only in Red Mountain has it been found of sufficient thickness and purity to be worked on an important scale. The workability of the ore depends largely upon the attitude of the inclosing strata. The beds of Red Mountain dip southeastward at moderate angles, which are usually fairly constant for the distance of a mile or more along the strike.

Character of the Ores.

The ores consist essentially of red hematite, intimately mixed with varying percentages of lime and silica. According as the ore is high or low in lime it is termed "hard" or "soft" ore. While the soft ore carries a higher percentage of iron the hard ore has the advantage of containing almost enough or in places enough lime to flux the silica which it contains.

The Rockwood or Red Mountain formation in which the ores occur is extremely variable in thickness and in the details of its stratigraphy. The presence of beds of hematite somewhere within the formation is, however, a remarkable persistent feature, not only throughout the whole length of the Appalachians, but in rocks of equivalent age in Wisconsin and New Brunswick.

Mining conditions at present are doubtless at their most favorable stage. In the summer of 1906 there were no less than 33 mines actively producing red ore in the district, besides seven or eight workings which have been inactive since the soft ore was exhausted from them.

In July, 1906, the deepest slope in Red Mountain was reported to be 2100 ft. long. No deterioration in either quality or thickness of the hard ore in the direction of dip has yet been disclosed by the deeper slopes. This is an encouraging fact in so far as it can be used as a measure of the ore ahead of shorter slopes.

The Pennsylvania Railroad's Improved Coaling Facilities.

A great saving of time in the coaling and watering of locomotives has been accomplished by the Pennsylvania Railroad Company by constructing new coaling stations at Denholm on the middle division and at Thorndale on the Philadelphia division. As these two stations are substantially alike the description of the one at Denholm will suffice. The four main tracks of the road as they approach Denholm branch out into twelve tracks and across these extends the coaling bridge. Twelve locomotives can be supplied with coal from the bridge and water from standpipes at the same time. Ten of the tracks are for freight trains and two for passenger trains, but as the latter carry a sufficient supply of coal and water to last them throughout their run they rarely have to stop. The principal advantage is realized in accelerating the movement of freight trains, and incidentally it has developed a tendency on the part of the train crews to hurry, as it is possible for one to pass another here by coaling quicker.

The bridge is 210 ft. long, and supports a coal bin running its entire length, which is lined with solid concrete and has chutes underneath. Along the top of the bridge is a track for the cars which bring in the coal. Near one end is the sand tower. Smaller cars running on a narrow gauge track carry the sand out over one side of the bridge to the sand bins. From these it passes through chutes to the sand boxes in the locomotives while the tenders are being loaded with coal.

The machinery and plant are quite elaborate. There is a power house 100 ft. long and 40 ft. wide with boilers, dynamos and pumps, and in the cellar an oil storage room. Various grades of lubricating oil used on the trains are kept there in steel tanks, the oil being forced up from them by air pressure.

Each locomotive stops at the station, with its tender directly under the coal bin, and the locomotive itself is over two arched tunnels which run beneath the twelve tracks. Into one of these a chute opens through which the ashes from the locomotive firebox are delivered. An endless ash conveyor runs through each tunnel under the chutes and carries the ashes and sparks out and dumps them into a bin from which they are taken by the regular ash cars.

The station required considerable new track construction before it could be put into operation. The incoming coal track, the ash car track and various sidings had to be arranged so that they could not interfere with traffic. Cars bringing the coal from the locomotive are switched to a siding, which rises abruptly so that from the top of the incline the cars can be dropped to the bridge and discharge their loads into the bins. When empty they are passed on and rolled down a grade ready to start back to the mines. In this way they never impede the movement of trains. The tracks for empty ash cars, the shop siding and the coal car siding by the power house are all arranged so that cars going to and from them will never cross main traffic tracks. Car inspectors stationed here look the train over while the locomotive is coaling, inspecting the air brakes, making slight repairs, inspecting the wheel flanges and when necessary cutting out a car and putting it on the shop siding if it is not fit to go further.

At a meeting of the Society of Automobile Engineers in the Flatiron Building, New York City, March 16, it was decided to hold a summer meeting of the society at Buffalo between July 20 and August 10. The meeting will occupy three days, of which one will be devoted to visiting the local automobile manufacturing plants. T. J. Fay, Henry Hess and H. M. Swetland constitute the committee in charge of arrangements. A Publication Committee to take charge of all papers and publications of the society was appointed, consisting of H. F. Donaldson, H. F. Towle and A. L. Clough. A regular business meeting will be held in May. The president announced that this society has been recognized as a permanent engineering society by the American Society of Mechanical Engineers and that the latter will, therefore, exchange papers with it.

tions might be prolonged, the managers had not agreed last week that the syndicate could not be renewed.

Worldwide industrial activity accounts in large part for the profitable operation of iron and steel works in all the leading producing countries in the past two years, and in the past year in particular agreements as to prices have been little needed. It may be that the prosperity of these months, that has been so plainly independent of syndicate operations, has begotten such a spirit of independence in the members of the Verband that exorbitant conditions have been named by them as well as by the few important works that have operated heretofore outside the syndicate. It is not surprising that seemingly insurmountable obstacles have arisen—so great that the alternative of an actual merger of interests after the plan of the United States Steel Corporation has been suggested. That would mean that plants would be put in at valuations based on high tide prosperity and that the new combine would enter upon less prosperous times hobbled by overcapitalization and threatened with all the ills that overtook the financial plans of the United States Steel Corporation in its earlier years. It could not be expected that the lesson of the experience in this country in 1903 and 1904 would save the German financiers entirely.

Whatever the plan finally adopted it is conceded that the German steel trade faces a difficult situation. The principal reason for believing that some form of agreement will come out of it is the tremendous stake the steel companies there have in preventing a relapse to the old régime of unrestricted competition. If the Verband disintegrates the international rail agreement would doubtless go with it, and the alignment of forces in the international steel trade might undergo some important changes.

Exciting Prejudice Against the Railroads.

Washington dispatches to the daily papers last week took a singularly warped view of the proposed advances in railroad freight rates. The statement was made, and apparently made seriously, that the advances are to be regarded as a retaliatory move by the railroads for the restrictive legislation to which they are being subjected. The moderate advance of 2 cents per 100 lb. for carrying grain from Chicago and St. Louis to Atlantic ports is characterized as an attempt to impose new burdens on the farmer, who, it is assumed, will have to take that much less for his product. The proposition to mark up rates on manufactured articles about 10 per cent. is alleged to be an effort to make the general public believe that Government interference with railroad interests has caused this addition to the cost of important staples. Thus, according to these dispatches, the railroads are simply playing with their freight rates in the hope of turning the wrath of the people against the Federal and State authorities. The charge is a clumsy effort to work up prejudice against a legitimate business interest which is practically forced to take steps to make its revenue commensurate with increased expenses.

The fact is surprisingly ignored that the railroads in the past year or two have been suffering a steady appreciation in the price of almost everything entering into their cost of operation. They have further been obliged to make important advances in the wages of all classes of their employees. For a few years the railroads have been quite prosperous, but possibly not more so than business enterprises generally. Prosperity during this time has not been confined to classes, but has been almost universal in this highly favored country. But with pros-

perity has come a higher cost of almost everything. Re-adjustments to conform to the higher cost are being made wherever those affected have the power to control any of the elements of income or outgo. The railroads have not been swift to move in this matter. Not until they were obliged to make important advances in wages did they begin to consider the question of marking up their freight schedules. To say that this is simply done as a piece of spite work, as a retaliation for legislation against their interests, is to ignore completely an economic condition.

International Iron and Steel Exports.

The statistics of pig iron production in the United States, Great Britain and Germany in 1906 show a total quite close to preliminary estimates, and suggest an interesting fact concerning the export trade of the three countries. The pig iron production of last year compares as follows with that of 1905 and 1904, the figures being in gross tons for the United States and Great Britain and in metric tons for Germany:

	1906.	1905.	1904.
United States.....	25,307,191	22,992,380	16,497,033
Germany	12,478,068	10,987,623	10,103,941
Great Britain.....	10,149,388	9,592,737	8,562,658
Totals.....	47,934,647	43,572,740	35,163,632

The presumption is that in the activity following the repair of losses from the Boer war and later the impetus given to European and Oriental commerce and industry by the peace between Russia and Japan, the supplying of the wants of countries not large producers of iron and steel has contributed to the unprecedented totals of the three leaders in iron and steel. The fact is that the home demand in the three leading countries themselves required much the greater part of their increase in output over 1905. Thus, the total pig iron production increased 4,362,000 tons over that of 1905, while the exports of iron and steel from the three countries were 1,500,000 tons more than in 1905, or about one-third the gain in output. The United Kingdom contributed 900,000 tons of the increase, exporting 4,600,000 tons in 1906 and 3,700,000 tons in 1905; the United States 1,325,157 tons in 1906, of such commodities as are reported by weight, and 1,010,255 tons in 1905; Germany, 3,600,000 tons in 1906, against 3,300,000 tons in 1905. The London *Engineer* points out that Great Britain's favorable trade balance in iron and steel was increased further, her imports being 100,000 tons less last year than in 1905; on the other hand, the iron and steel imports of the United States rose from 416,000 tons in 1905 to 584,000 tons last year, and those of Germany from 300,000 tons in 1905 to 600,000 tons in 1906.

On previous occasions we have pointed out how cross currents show themselves in the international iron and steel trade. Details are not yet available to show what quantities of the various forms of iron and steel exported from the United States went to Great Britain, for example. It is known that of the billet, bloom and ingot exports, which were 192,616 tons last year, nearly all went to Great Britain, besides quantities of plates, bars and structural steel. On the other hand, of Great Britain's increase of 900,000 tons in iron and steel exports, 680,000 tons was pig iron, and out of this 440,000 tons represented increased pig iron exports to Germany, Belgium, France and the United States. Such a gain is well understood to have been due to the exceptional demand upon the capacity of all the steel making countries, and therefore is not to be given too great significance in figuring on the outlook for the British iron trade in 1907 and 1908. It is in finished material rather than in pig

iron that increased exports are to be sought, and it is not to be expected that Great Britain can make up in finished forms shipped out of the country for the falling off in pig iron exports that will come when conditions in Germany and the United States more nearly approach the normal. The probabilities are, indeed, that as the high pressure relaxes, Germany and the United States, as well as Belgium and France, will increase their shipments of finished steel to Great Britain.

Already evidence appears that the rate of increase in British iron and steel exports is declining. In January British exports of iron and steel were 453,350 tons, an increase of 116,418 over January, 1906; in February the total was 373,504 tons, an increase of 58,962 tons over February, 1906. It is noteworthy that in the first two months of this year British imports of iron and steel were 141,262 tons, or at the rate of but 847,572 tons a year, while the total imports in 1906 were about 1,500,000 tons. As the decline is chiefly in semifinished steel it is evident that the scarcity and high price of steel in the United States and Germany are holding at home practically their entire production.

An American Museum of Security.

The American Institute of Social Service gave an informal dinner to representatives of the technical papers last Friday evening, March 22, at the Aldine Club, New York City, for the purpose of acquainting them with the movement now on foot by the institute to establish a permanent national Museum of Security. This will probably be located in New York, and will contain all forms of devices for the protection of those engaged in industrial pursuits. Such museums are now to be found in a number of the larger foreign cities and have proved of great humanitarian value. A temporary exposition of the same sort was held in New York in the Museum of Natural History from January 29 to February 12, a report of which was given in these columns February 7. In the same issue the objects and work of the Institute of Social Service were more fully discussed in an editorial on "Industrial Welfare."

A more deserving cause could hardly be imagined, for it is highly important to our commercial and material progress that due consideration be given to the safety and well being of the laboring public. It is perhaps in large measure due to the American spirit of enterprise that the shocking instances of disregard for human life and safety are so numerous. Statistics show a greater number of accidents in this country and a much greater fatality than in any other country, and the small value that is apparently put on humanity here has become a source of unfavorable comment, particularly from those familiar with the conditions abroad.

Like all worthy movements, it is practically sure of universal approval and support as its aims become known to the public. The initial step has been taken, and it only remains to obtain funds to make it of instant and permanent benefit. It is estimated that the very moderate sum of \$25,000 would cover the expenses for the first year's campaign, and when this amount has been raised and expended it is reasonably expected that the growth of the work will be assured and further funds for its maintenance contributed without much soliciting. For the present, however, means are scarce and the support of all who can be reached is earnestly enlisted. An appeal is now being made to manufacturers and operators of industrial plants and public utilities, through the papers they read, to give their material assistance as speedily as possible, in amounts from the smallest to the largest they are inclined to give. The return from the investment scarcely needs to be pointed out. The humanitarian side will be justification enough to the majority, but there is the additional and more direct pecuniary reward in the reduction of liabilities to damage suits.

The museum to be founded first needs quarters, for which money is immediately necessary. Many exhibits

have already been donated, although as yet the call for them has not been very widely circulated. Those which were shown at the recent exposition are now being taken from city to city as a potent example of what the nature of such a museum would be and what benefits it will afford. Chicago has had them and an exposition has been held there. Next they will go to Boston, and thereafter a number of the other large cities are to be visited.

To return to the subject of the dinner: there were some 18 editors and representatives of the leading technical papers in attendance as the guests of Dr. Josiah Strong, president, and Dr. Wm. H. Tolman, director, of the American Institute of Social Service. Following the dinner Dr. Tolman gave a very interesting talk, illustrated with lantern slides, demonstrating principally the work as it is now being carried on in several of the important European cities. The photographs were gathered during a trip through Germany, France, Italy and other countries, and showed a number of very creditable devices for protecting operatives in dangerous occupations. A number of these could be advantageously adopted here, with little or no modification. Others for our needs could be materially improved upon. Alternating with the views were reproductions of clippings from the daily papers of the country dealing with accidents that without exception could have been avoided if proper precautions had been taken. Altogether it made a very striking object lesson and those present were much impressed. The institute's headquarters are at 287 Fourth avenue, New York City.

Evenness in Hot Blast Temperature.

BY OTTO JASCHKE.

A very important matter in blast furnace practice is to keep the temperature of the hot blast as even as possible. Even heat gives an even furnace run and uniformity of product. With the usual equipment of four stoves there will be no two of them giving exactly the same heat. This variation, mostly due to flue dirt in the stoves when there is no cleaning of waste gases, will be shown very clearly in the pyrometer record. Even though all four stoves give the same amount of heat, we can see in the pyrometer record an up and down movement, resulting in a saw tooth line, due to a stove losing from 50 to 200 degrees in 1 hr. A new or well cleaned stove naturally loses less than an old or dirty one. The ideal record would be a straight line, and there is a way to obtain such a regular heat.

We have, say, four stoves on a furnace—A, B, C and D—and we want an even temperature of the hot blast of 1000 degrees. Stove A is supposed to be on wind at a temperature of exactly 1000 degrees. After 15 or 20 min. the heat will drop down a little. Now we open the cold blast valve of stove B, but only so wide as to bring the heat up to 1000 degrees, say one-fourth. After a while we open the cold blast valve one-half, and so on until it is fully open. Then we go back to stove A and close the cold blast valve for about one-fourth, increasing the shut-off gradually until it is closed entirely. Then we take stove C and start by partly opening the cold blast valve of this stove, repeating the procedure in the other cases. I have seen the working out of this plan so that an even temperature of 900 degrees has been maintained in the blast for 6 or 8 hr. Only two stoves were used in that time. The other stoves had to be closed in order to prevent them from getting too hot, and all the gas could go to the boiler house. It takes, of course, a good hot blast man to get such results and to insure that there is no irregularity in the furnace run. For foundry iron, since it requires a very regular heat, this is especially desirable practice.

It is about settled that the car plant of the Wason Mfg. Company, Springfield, Mass., is to be acquired by the J. G. Brill Company, Philadelphia, Pa. While the sale to the latter company has not been effected, we are informed that it is probable that the Brill Company will take the plant over.

PERSONAL.

C. J. Kirk, president of the New Castle Forge & Bolt Company, New Castle, Pa., who has been quite ill with typhoid fever, has recovered and sailed last week from New York on a trip to Cuba, Mexico and other southern points, to be gone several weeks.

E. H. Nagelstock, who has been connected with the sales department of the General Electric Company, New York City, has engaged with and will represent the Gregory Electric Company, Chicago, in this city and vicinity.

Albert Sheeler has been promoted to the superintendency of the Republic Iron & Steel Company's plant at Muncie, Ind., vice J. M. Steller, resigned, to engage with the Graham Nut Company, Pittsburgh. James A. Carr, formerly in charge of the shipping department, has been made assistant superintendent.

Frederick A. Waldron has resigned his position as engineer of works with the National Cash Register Company, Dayton, Ohio, and contemplates opening an office in New York City as consulting and constructing engineer.

E. M. McIlvain, formerly president of the Bethlehem Steel Company, has been elected president and general manager of the Robins Conveying Belt Company, Park Row Building, New York.

F. H. Daniels, Worcester, Mass., chief engineer of the American Steel & Wire Company, sailed for home last week after a two months' trip in Europe.

George H. Schuler, Birmingham, Ala., who resigned recently as treasurer of the Southern Steel Company, will go abroad in May, accompanied by his family, for a tour of some months.

Major G. Prunerl of the Royal Italian navy, is now in New York visiting some of the more important iron and steel and machinery manufacturers. The object of Major Prunerl's visit to this country is to inspect the armor plate being built at the Midvale Steel Works, Nicetown, Philadelphia, for the Italian Government.

J. H. Porter, heretofore connected with the Buffalo Steel Company, Tonawanda, N. Y., has resigned his position.

Jesse F. Wellborn has been chosen by the Board of Directors of the Colorado Fuel & Iron Company to succeed the late Frank J. Hearne as president of the company. Mr. Wellborn entered the service of the company as a clerk 17 years ago, and at the time of President Hearne's death was vice-president and sales and traffic manager.

John Dowling has succeeded Gentry Hillman as general manager of furnaces for the Southern Steel Company and will take charge April 1. He will have charge of the furnaces in Gadsden, Trussville, Rising Fawn and Chattanooga.

T. G. Bush, Jr., has been appointed superintendent of the Gadsden Furnace of the Southern Steel Company. He recently resigned a similar position with the Alabama Consolidated Coal & Iron Company.

W. G. Williams, late vice-president and general manager of the Wilmington Iron Company, Wilmington, Del., was presented on March 23 with a handsome watch and chain by his former employees in token of their esteem.

The Cincinnati Foundry Foremen.—The second annual banquet of the Associated Foundry Foremen of Cincinnati and vicinity was held at the Grand Hotel on the evening of March 23. Papers were read as follows: "Our Foundry Foremen's Association," by H. J. Holmes, superintendent of the L. Schreiber Sons Company; "Benefits to Be Derived from Organization," by Charles F. Waltz, secretary of the Employers' Association; "Immigrant Labor and Cincinnati Industrial Development," by W. L. Finch, secretary of the Cincinnati Industrial Bureau; "The Foundry Foreman," by Chas. J. Goehring, of the American Valve & Meter Company; "Is a Chemist a Good Investment in a Foundry?" by C. H. Thomas, superintendent of the Modern Foundry Company. E. W.

Cadwell acted most acceptably as toastmaster, and the evening was passed very pleasantly as well as profitably. The officers of the association are as follows: H. J. Holmes, president; Edward Binns, vice-president; E. W. Cadwell, secretary; Chas. J. Goehring, treasurer; Andrew Dunn, sergeant-at-arms.

OBITUARY.

JACOB REESE, for many years a prominent figure in the Pittsburgh iron trade, died from apoplexy March 26 at his home in Sharon Hill, near Philadelphia, aged 82 years. He was a prolific inventor, having taken out over 200 patents in connection with the manufacture of steel and iron. With his father he is said to have made the first iron by the boiling process in this country. The universal mill is also credited to him. One of his patents covered the basic process, but it was not commercially developed by him, this being due to the subsequent exploitation of the same field by Thomas and Gilchrist of England. In many other matters he anticipated improvements in iron and steel processes, being much in advance of his time. He was actively engaged for many years in the operation of rolling mills at Pittsburgh, his firm of Reese, Graff & Woods long occupying a leading position in the trade. He was also connected with other manufacturing enterprises.

THOMAS B. BRANNON, for 37 years superintendent of the Lewistown Foundry & Machine Company, Lewistown, Pa., died March 25.

DAVIS KNAUER died March 17 at Knauertown, Chester County, Pa., aged 82 years. He was one of the largest land owners in Chester County. Years ago he was extensively engaged in charcoal burning. He operated a forge and stone quarries at the Falls of French Creek, was part owner of the rolling mill at Douglassville, and operated a furnace in the Shenandoah Valley, at Woodstock, Va. He was also associated with Josiah Keim in the manufacture of farm machinery, &c., at Knauertown, and in extensive building operations. He was a director of the National Bank of Spring City for 36 years.

The Worth Brothers Company, Coatesville, Pa., recently rolled on one of its plate mills 18 copper ingots, each weighing 6300 lb., into plates 122 x 216½ in. and 63-100 in. in thickness. These plates were rolled for the Baldwin Locomotive Works, Philadelphia, Pa., and are the first plates of that kind ever rolled by the company. It is understood that they will be used to line boilers of locomotives, which are being made for export to France. Eighteen more plates of the same size will be rolled at an early date for the same purpose.

The statement is made that the business of the General Electric Company for the first six weeks of the new fiscal year, beginning February 1, displayed an increase of between 30 and 35 per cent. over the corresponding period of 1906. Orders received during this period were at the rate of \$78,000,000 for the year, this comparing with a total gross business of \$58,000,000 for the year just ended. At least nine months of the present year are expected to yield large volumes of orders.

One of the important matters that will come up for action at the convention of the Amalgamated Association to be held in May will be a resolution for an insurance department in connection with the different lodges. The matter has been before previous conventions and was always defeated, but it is now said that most of the lodges are in favor of the scheme and that it will probably be adopted.

The Theodore Hertz Metal Company, Tenth and Poepping streets, St. Louis, Mo., is sending to the trade a book regarding its Babbitt metals, which are made in a number of different grades, for both heavy and light machines. The company also makes all kinds of solders, as well as various kinds of type metals.

Pennsylvania Terminal Progress.

Now that a period of favorable weather conditions has begun, work on the Pennsylvania Railroad's New York terminal and tunnels is going forward with great rapidity. A considerable section of the tunneling is actually completed. There has been another meeting of tunnels, this time in Long Island City. The southernmost of the four tubes being driven from East avenue, under the Long Island Railroad passenger terminal, toward the East River has reached the river shaft, and is now connected with the tubes that go out under the water. Only three or four days ago the headings bound in opposite directions under Thirty-second street, Manhattan, came together nearly under Third avenue, so that there are continuous passages from the East River to Fifth avenue under both Thirty-second and Thirty-third streets.

Under the East River the east iron tubes, bound in both directions, have gone about 500 yd. Those going east from Manhattan, having started a full year earlier, are more advanced. The three to the south, known as B, C, and D, are now piercing through the rock of Blackwell's Island reef. The tubes bound from the Long Island City side toward Manhattan are about 350 ft. out under the water. The meeting of the eastbound and westbound tubes will take place considerably to the east of the middle of the river. The work under the East River recently has been more satisfactory in every respect than it was in the earlier stages.

About 85 per cent. of the excavation work in the area bounded by Seventh and Ninth avenues and Thirty-first and Thirty-second streets is done. Between Seventh and Eighth avenues practically all the excavation is completed. The greater part of the steelwork which is to support Eighth avenue as a bridge over the underground tracks is in place. The foundations for the station columns are being laid.

On the New Jersey side, between Harrison, on the present main line of the railroad, and the Bergen Hill tunnels, several bridges have been constructed. The one over the Hackensack River is nearly finished. Under Bergen Hill itself, through the hard Palisades rock, the tunnelers are making more rapid progress than at any previous time. They are now at work in four sets of headings—west from the Weehawken shaft, east from the Hackensack portal on the edge of the meadows, and east and west from the central shaft, 220 ft. beneath the crest of the hill.

Farm Machinery and Automobile Drawback Regulations.

WASHINGTON, D. C., March 26, 1907.—The Treasury Department has prepared a series of regulations for the allowance of drawback of duty paid on imported pig iron and steel billets used in the manufacture of farm machinery and implements intended for exportation. In liquidation, the quantities of imported pig iron and steel billets which may be taken as the bases for the allowance of drawback may equal the quantities declared in the drawback entry after official verification of the exported quantities, provided it shall not exceed the weights shown in the sworn statement, and to the net weight of the imported iron contained in the exported articles an addition of 5 per cent. thereof may be made for loss in manufacture.

The Department has also prepared regulations for the allowance of drawback of duty paid on imported ball bearings and magnetos used in the manufacture of automobiles intended for export. In liquidation, the quantities of imported ball bearings and magnetos with coils and switches attached, which may be taken as the bases for the allowance of drawback, may equal the quantities declared in the drawback entry after official verification of exported quantities, provided they shall not exceed the quantities shown in the manufacturers' sworn statement for each automobile.

W. L. C.

The Hill Ore Lease.

Publication was made for the first time, through the annual report of the United States Steel Corporation which came out last week, of the fact that the lease of the Hill iron ore lands may be terminated by the Corporation on January 1, 1915. Later comment on this phase of the deal adds the detail that notice of intention to terminate the arrangement must be given two years in advance of the date named. It had been supposed, in the absence of specific information to the contrary, that the lease ran until the exhaustion of the ore, and uncontradicted statements to that effect were published when the deal was announced last fall, though it is now said these were without official sanction.

The insertion of the option to cancel, it is now explained, was one of the conditions made by the Steel Corporation, not with any expectation of exercising it, but to provide for any contingency that might arise in the next six years. The natural presumption is that the value of the lease to the Steel Corporation will be emphasized by the drain that will be made upon Lake ore supplies in the years immediately ahead. If large bodies of ore now unknown are discovered by the Corporation meanwhile, or by interests apart from the Corporation, their addition to the known supply would make the ore situation so much less acute. But if the maintenance of its supremacy seemed to demand that the Steel Corporation take over the Hill properties last year it may be presumed reasons will exist in 1913 for retaining control of the properties rather than allow them to go to the strengthening of competitive interests. If heavy expenditures should be made by the Corporation in the next few years in developing the Hill mines, that would constitute a strong reason for holding on when the option came to be exercised.

On the other hand, even if the lease should be surrendered, the Corporation will have had a distinct advantage in holding the Hill ores out of the market for a term of years, and if reasons exist sufficient to justify the Steel Corporation in cancelling its lease, the same reasons would operate to prevent other steel companies from taking it up where the Corporation left off. Under the minimum requirements of the lease the Steel Corporation will have mined and shipped over the Great Northern road 27,000,000 tons of ore from the Hill mines by January 1, 1915.

The United States Steel Corporation has authorized the American Steel & Wire Company to construct in Cleveland a hot mill for rolling thin flats and a wire mill for drawing wire for the manufacturing trade. The plant will also produce bale ties for the market. Inasmuch as real estate in the city of Cleveland is held at very high figures it was thought best to secure property along the line of the Newburgh & South Shore Railway, on which the mills will be erected. The exact tonnage of output is not known definitely, but it is most likely that upward of 1000 men will be employed. The location from a freight distribution standpoint is a good one, inasmuch as the Newburgh & South Shore Railway, which partakes of the nature of a belt line, connects with most of the trunk lines. The drawings are being completed rapidly, and it is expected that work will commence within a few weeks. The plants will contain the most up to date machinery, all driven by electric power generated by motors driven by gas engines.

The French Government has decided to use the Eiffel Tower as part of the army wireless telegraph system. Using it in the last army maneuvers, the War Department was able to maintain communication with the Eastern frontiers along the Vosges, and since then the tower station has communicated with London and Berlin. New installations are being made for maintaining regular communication with Algeria and Tunis.

Denatured Alcohol Exhibit at Jamestown.

WASHINGTON, D. C., March 26, 1907.—Dr. Charles E. Munroe, professor of chemistry of George Washington University, who has been appointed superintendent of the special alcohol exhibit at the coming Jamestown Exposition, has already secured the co-operation of a large number of important interests that will insure an exceedingly complete collection of all apparatus employed in the production and consumption of alcohol. The work of preparing the Jamestown exhibit has been not a little handicapped by the discovery several months ago of defects and omissions in the original free alcohol law passed last June, and certain branches of the work were brought to a standstill pending the enactment of the supplemental law, which has just been placed upon the statute books. The work is now being pushed forward rapidly, however, and a considerable part of the exhibit will be in place when the Exposition opens on April 26. It has been deemed wise, however, to extend the time within which exhibits will be received, and while no date has been finally determined it is understood that deliveries may be made not later than July 1, provided space is still available.

Exhibit of Farm Stills.

Dr. Munroe regards the passage of the supplemental law, enacted in the closing hours of the last Congress, as of great importance with respect to the liberalizing therein of the regulations governing small farm distilleries, and he is now in correspondence with a number of concerns making distilling apparatus, with a view to securing exhibits of small, compact stills that can be produced at a cost within the means of the average farmer.

Through the good offices of the International Harvester Company, the Otto Gas Engine Company, Philadelphia, and the Nash Gas Engine Company, New York, have entered several of their internal combustion engines, which will be supplied with compression devices and vaporizers especially suited to the use of denatured alcohol. Such of the machinery and apparatus of the exhibit as may require motive power will be operated by these engines. A feature of the exhibit will be a number of automobiles.

Alcohol for Naval Launches, &c.

It is probable that the Navy Department will contribute to the alcohol exhibit a motor boat fitted for the consumption of alcohol, and in this connection it seems probable that in a comparatively short time the entire navy will equip its launches and possibly some of the smaller torpedo boats for the use of denatured alcohol. The naval authorities are very enthusiastic over the substitution of denatured alcohol for other forms of liquid fuel and experiments are now being made that promise the highest measure of success, especially in view of the fact that for such purposes it is not at all necessary that the cost of alcohol should be put upon a close competitive basis with petroleum products.

The correspondent of *The Iron Age* is permitted to quote in this connection an interesting communication which Dr. Munroe has written in reply to inquiries from J. Murray Forbes of Boston, an enthusiastic yachtsman, who is experimenting with alcohol as fuel for a small auxiliary yacht in which the motor power is a 25-hp. Standard gas engine. Replying to these inquiries Dr. Munroe says:

"Relative to the engine of which you speak, the Standard engine, I will have to say that none of these engines has yet been entered for the Exhibition, though several other makers have entered theirs and they will all be carefully tested by Governmental authorities in connection with the tests of fuel and engines which have been carried on by this force since the opening of the St. Louis Exposition, through which we shall be able to obtain positive data, since the engines using alcohol will be tested with the same instruments, by the same men and in a similar manner to that employed in the tests of engines operated by coal, producer gas, gasoline and other fuels.

"As to the other matters, I have to say that there is no question, as regards fire, of the greatly increased safety of alcohol over gasoline. For the past 30 years I have dealt with these matters and know this to be the case. As regards volatility, it would be said that the boiling point of gasoline is below zero, C., while the boiling point of pure alcohol is about 78 degrees C., and that of such alcohol as will be used in engines is much higher. The readiness with which gasoline will volatilize under such conditions as you have spoken of so as to produce pressure in the tanks when exposed to the heat of the sun is very much greater than that of alcohol. It cannot be denied that alcohol will volatilize under such conditions and produce some pressure, but without having any actual measurements at hand, from my general knowledge of the behavior of alcohol I do not hesitate to say that the pressure produced is quite within the limit of the resistance of the container."

Comprehensive German Exhibit.

Dr. Munroe is in receipt of a cablegram from Mr. Charles Le Simple, honorary commissioner of the Jamestown Exposition for Germany, stating that a comprehensive collection of devices for the production and consumption of denatured alcohol has been gathered and will be shipped to the United States immediately. This collection includes the stills employed in the agricultural districts of Germany in the production of alcohol from potatoes and other farm crops, vegetable refuse, &c., stoves for heating and cooking, lamps of various sizes, &c. The collection will no doubt afford an opportunity to American manufacturers to inspect the practical results of the free alcohol policy of Germany, of which they will hasten to avail themselves.

The committee of manufacturers organized several years ago for the purpose of securing the enactment of free alcohol laws will also install a large collection of apparatus and devices for the utilization of alcohol, especially for heat, light and power. A feature of this exhibit will be a number of lamps ranging from 10 to 300 candlepower each, the larger ones rivaling in brilliancy the most powerful arc lights. Certain types of these lamps have been so much improved since the passage of the original free alcohol law that they can now be lighted as easily as a kerosene lamp. The burners are so constructed that they can be readily attached to the reservoir of an ordinary lamp and employ the same style of chimney, &c.

Dr. Munroe is in correspondence with the Semet-Solvay Company and other concerns engaged in making coke in by-product ovens, in the hope of inducing them to make an exhibit at Jamestown of the processes by which pyridine bases and ethylene are produced. It will be remembered that pyridine bases are specified as one of the denaturing agents for completely denatured alcohol. Ethylene is a product recovered from the gases of the by-product ovens, and in Dr. Munroe's opinion will ultimately be utilized on a very large scale for conversion into ethyl alcohol. The by-product coke industry, therefore, may produce both pure alcohol and one of the denaturing agents in unlimited quantities, and the demonstration of the processes would constitute a most interesting feature of the alcohol exhibit.

W. L. C.

The Electro Metallurgical Company.—About six months ago the Electro Metallurgical Company was incorporated and began the manufacture at Niagara Falls, N. Y., of ferroalloys, principally ferrovanadium, ferrotungsten and low carbon ferrochrome. Additional equipment is now being installed to increase materially the output of these and other ferroalloys. In February the company acquired the works at Kanawha Falls, W. Va., and the business, good will and patents, so far as they relate to the manufacture and sale of ferroalloys, of the Willson Aluminum Company. Additions are now being made to these works with the object of increasing the output of ferroalloys, and more particularly of ferrochromium and ferrosilicon. The Electro Metallurgical Company's general offices are located at 157 Michigan avenue, Chicago, and it has also an office at 79 Wall street, New York.

Interstate Commerce Problems.

WASHINGTON, D. C., March 26, 1907.—The Interstate Commerce Commission is now considering a change of practice of great interest to shippers in all lines. It is proposed to abandon the present system of dispatching subcommissions to distant cities to take testimony and instead to employ a corps of examiners, each with headquarters at an important shipping center, authorized to take testimony and put the evidence into shape for consideration by the full commission. It has been apparent for some time that the practice of sending subcommissions to distant cities to take testimony is reducing the efficiency of the commission as a whole and is not effecting any material saving of time in hearing and disposing of cases. On the other hand, to require all the parties to a controversy to come to Washington would in many cases work a severe hardship and would be practically prohibitory in the case of small shippers, many of whom would suffer injustice rather than incur the expense of a long railroad journey in the hope of securing the readjustment of a freight rate or the refunding of a comparatively small sum. As a solution of the difficulty, the assignment of examiners to take testimony seems entirely practicable. Such examiners would have no more authority than referees appointed by civil courts to take testimony and it is probable that the employment of such officials having no judicial power would result in expanding the records in many cases, but, on the whole, there is no doubt the change would be for the interest of both shippers and carriers and would enable the commission to keep its work up to date.

Since the passage of the so-called freight rate law amending the interstate commerce statutes an enormous number of new complaints have been filed, and the commission is now far in arrears in its work. Unless some plan is devised for relieving the commission of at least a part of the drudgery incident to the taking of testimony it will be impossible to prevent the accumulation of large arrears of business.

Plans for New Legislation.

The members of the commission strongly favor President Roosevelt's plan to secure additional legislation for the control of the railroads in the new Congress and are exerting their influence in many directions to this end. The plan embodies two important features—first, the valuation of the tangible property of the railroad systems of the country as a basis for the determination of reasonable freight rates, &c., and, second, the regulation by the Federal Government of the issue of stocks, bonds and other evidences of indebtedness of common carriers engaged in interstate commerce.

The general features of the plan favored by the President and approved by the commission's experts for the valuation of the railroads were incorporated in a bill presented at the last session of Congress by Senator La Follette of Wisconsin. This measure makes it the duty of the Interstate Commerce Commission "to investigate and ascertain the fair value of the property of every railroad engaged in interstate commerce." Every railroad is required to furnish to the commission from time to time such maps, contracts, reports and other data as may be desired, and each road is required to co-operate with the commission in the work of valuation. It is therefore provided that whenever the commission shall have completed the valuation of the property of any railroad, and before the valuation shall become final, the commission shall give notice in writing to the railroad, stating the valuation decided upon, and shall allow the company 20 days in which to file a protest, in default of which the valuation shall become final. If notice of contest is filed by any railroad the commission shall fix a time for a hearing and shall hear and consider any evidence that may be offered. Unless changes are made as the result of the hearings the valuation shall be regarded as final "and shall be *prima facie* evidence of the fair value of the railroad property in all proceedings" that may be brought under the interstate commerce laws.

The statisticians of the commission have found themselves seriously embarrassed in calculating the receipts

and income of the railroads in connection with complaints of illegal or unfair freight rates, because they have had no basis upon which to estimate the property of the roads, except such as is presented by their stocks, bonds, &c. The carrying out of President Roosevelt's plan for the valuation of the roads by the Interstate Commerce Commission would supply this basis, and it is therefore strongly favored by the commission.

Federal Control of Stock Issues.

The recent disclosures in high railroad finance have induced the President to give considerable thought to another measure of which he has been making a study for several months. This project involves the Federal control of the issue of stocks, bonds, &c., by interstate railroads, and was recently put into concrete form by Representative Calder of New York. In a bill presented in the House just before the adjournment of the recent Congress Mr. Calder provides that before any corporation that is engaged as a common carrier in interstate commerce shall increase its capital stock or its bonds or any other form of indebtedness requiring the action or sanction of its Board of Directors or stockholders, it shall apply to the Interstate Commerce Commission in writing, setting forth the amount of the proposed increase, the facts justifying it, and the purpose for which it is desired. The commission shall thereupon fix a time and place for hearing the application, and shall require that such notice thereof be given as it may consider reasonable. Upon hearing, the Interstate Commerce Commission may permit such increase, or so much thereof as may be found warranted by the law and justified by the object for which it is sought, and may limit and regulate its issue. To such an extent as such stock shall not be so warranted and justified it shall be denied, and to the extent that such stock is denied it shall not be issued.

The bill further provides that no capital stock shall be issued to represent increased value of the corporate property without a corresponding increase in the amount of such property, nor shall any of the earnings of any such corporation be represented by any increase in the capital stock of the corporation. No capital stock shall be issued by any corporation until it shall have received the full value thereof, which must not be less than the par value of the stock. No stock, bond or other form of indebtedness shall be issued to acquire or in any manner hold or control, directly or indirectly, any other parallel or competing common carrier or any interest therein or any stock, bond or other form of ownership in or indebtedness of such other common carrier. All stocks, bonds and forms of indebtedness issued in violation of the proposed law shall be void.

Attitude of the Railroads.

In the opinion of the commission such a measure of Federal supervision of stock issues as is contemplated in the bill described would effectually prevent the watering of railroad stocks and afford a large measure of protection to the unwary investor. It is hardly necessary to say that there is great opposition on the part of railroads to both measures referred to, but in view of the populist laws aimed at the railroads recently enacted by a number of State Legislatures, it is not surprising that some of the railroad managers should prefer to have the Federal Government assume complete control of the carriers doing an interstate business, even if they should be obliged to accept both the valuation and stock control plans. All experienced observers of public affairs here unite in the opinion that there will be additional important railroad legislation in the new Congress. W. L. C.

Angola, a city of 3000 population, situated in north-eastern Indiana, has organized a commercial club. The citizens expect to place inducements in the possession of manufacturers seeking a location, which will cause them to establish their factories there. A large amount of money has been raised for the purpose, and the people of Angola are ready to spend it for the location of suitable business interests in their city. The essential requisites for manufacturing enterprises being unsurpassed, the citizens feel confident of their success.

NEWS OF THE WORKS.

Iron and Steel.

On account of the large demand for its tool steel, the Halcomb Steel Company, Syracuse, N. Y., is to increase the capacity of its plant. The improvements, which will be made during the next few months, will include the installation of additional gas producers and a 50-ton electric traveling crane for its open hearth department; an extension to the hammer shop to enable it to install two more large steam hammers with necessary heating furnaces, a locomotive crane, and additional machinery for its cold rolling and cold drawing departments.

At the receiver's sale of the tin plate mill of the W. H. Griffith Company, Waynesboro, Pa., held on March 20, only \$24,200 was bid for the plant, and the sale has been adjourned four weeks.

The Philadelphia Steel & Wire Company, Philadelphia, Pa., has just completed a reinforced concrete addition to its mills in Camden, N. J. This addition will be used for the finishing of rods for concrete work and other specialties. It will also straighten rods and have facilities for cutting rods to length up to 50 ft. Another specialty which the company will manufacture is "stirrups" for concrete work. Automatic machinery has been installed to enable about 10 tons per day of this class of work to be handled.

General Machinery.

The recent fire at the plant of the Charleston Iron Works, Charleston, S. C., did but little damage, and the company has placed its machine, boiler and blacksmith shops and foundry in operation. The company is preparing to replace the machinery that was damaged, and is now erecting new buildings to take the place of those burned.

The recent fire at the boiler and machine works of the Henry Goldner & Son Company, Philadelphia, Pa., destroyed the power plant, the blacksmith shop and a portion of the boiler shop. The company will rebuild the burned portion of the plant as soon as possible, replacing the old buildings with steel structures.

The Savill-Chandler Company, Canton, Ill., has begun the erection of new shops for the accommodation of its foundry and machine business. The new plant will quadruple the capacity of the old one, and will be equipped with modern machinery suitable for the building of mining cars and machinery. The contemplated expenditure for plant and machinery will amount to about \$40,000.

The Goodspeed Mfg. Company, Colorado Springs, Colo., has recently been organized with a capital of \$100,000. A principal feature of the business will be the manufacture of the Goodspeed valve, designed for use in stationary and locomotive engines; in addition the company will construct mining and milling machinery and steam and electric hoists. New brick buildings for boiler room and machine shop will be erected, work on which will begin at once. The total cost of the new plant is estimated at \$35,000. D. F. Miner is president; J. A. Morrison, vice-president; J. M. Scifers, secretary.

The Topeka Foundry & Machine Company, Topeka, Kan., recently incorporated with a capital of \$25,000, has purchased and will operate the Topeka Foundry, formerly owned by G. A. Millice and O. A. Holcomb. While the new company will continue the general foundry and machine business, a specialty will be made of the manufacture of Wysong autotractor gasoline engines, designed principally for farm use in plowing and other traction work.

The Blair & Gazzam Mfg. Company, Pittsburgh, has recently completed a large stamping mill for the Boston Consolidated Mining & Milling Company. The mill consists of 312 stamps, in batteries of four stamps each, the total capacity being 3000 tons per day. It will be installed near Garfield, Utah.

The Westinghouse Electric & Mfg. Company, Pittsburgh, has received a large order for electrical machinery, through its agents, G. & O. Braniff & Co., Mexico City, for the complete electrical equipment of mines at Temascaltepec by the Mineral Company El Ray of Mexico. The company proposes to operate some of its present steam hoists and pumps by compressed air, which will be supplied from an air compressor operated by a 150-hp. motor, by means of belt drive. A large number of transformers for supplying the various motors, in connection with pumps and shafts, as well as arc and incandescent lights, will complete the installation.

The George A. Hogg Iron & Steel Foundry Company, Pittsburgh, manufacturer of rolls, engines, rolling mill and tin plate machinery, has received an order from the Taunton New Bedford Copper Company, Taunton, Mass., for a large gear drive for driving its mill, and also an order from the Shenango Furnace Company for a top rigging for its blast furnace at Sharpsville, Pa.

A special meeting of stockholders of the Keystone Driller Company will be held at Beaver Falls, Pa., on May 9, to consider the matter of increasing the capital stock from \$500,000 to \$1,000,000.

The Chester Forging & Engineering Company, Chester, Pa., recently incorporated, has leased the first floor of the Moya-

mensing Building and expects to start in operation April 1. The principal business of the company will be the finishing of all kinds of crank shafts, in addition to which it will build special lines of machinery and do general machine work. A fully equipped forge shop will shortly be constructed. S. S. Tompkins is president; Henry P. Arnold, vice-president and general superintendent, and Joseph Messick, secretary and treasurer. Messrs. Tompkins and Arnold have for several years been connected with the Tindell-Morris Company, Eddystone, Pa.

Power Plant Equipment.

T. Sakauchi, chief engineer of the Ozoni Cement Company of Japan, visited Milwaukee last week and closed a contract with the Allis-Chalmers Company for steam turbine dynamos and motors. His company, which was one of the first Japanese manufacturers of Portland cement, is modernizing its plant and introducing the latest machinery.

Bids will be received at Chillicothe, Mo., until April 15 for the construction of a municipal electric plant. Burns & McDonnell, Kansas City, Mo., are the engineers.

The City Council of Clifton Falls, Va., will receive bids until April 8 for an electric lighting system.

Bids will be received until April 16 by the Comptroller of McKeesport, Pa., for making improvements to the water system, which will include the installation of a 6,000,000 gal. mechanical filtration plant, 10,000,000 gal. water softening plant, one 400-hp. boiler, two 7,000,000 gal. low lift centrifugal pumping engines, five smaller pumps, &c.

The city of Superior, Wis., has voted to construct a municipal lighting plant. The Common Council has retained Owen Ford, a constructing engineer of St. Louis, to make estimates and plans for the new plant and to prepare specifications to be submitted to bidders.

The Portland Railway & Power Company, Portland, Ore., has not yet completed plans for its new power plant on the upper Clackamas River, and it has not been decided what machinery will be installed.

The Best Mfg. Company, Pittsburgh, manufacturer of complete piping equipment for power plants and blast furnaces, has recently secured some large contracts, among which was one for the steam and hydraulic piping system, including valves, fittings, &c., for the St. Louis plant of the American Car & Foundry Company, to be completed in May, and steam and exhaust piping for the new 10-in. skelp mill now building by the Youngstown Sheet & Tube Company at Youngstown, Ohio. A contract was received from the Champion Fiber Company, Canton, Ohio, for its fiber works, which it is claimed will be the largest plant of its kind in the country. This contract calls for steam lines with necessary valves, fittings, &c., and is to be completed in June.

The Allis-Chalmers Company, Milwaukee, Wis., has recently received orders from the Boston Elevated Railroad Company, Boston, Mass., for two 2700-kw. generators; Bisbee Improvement Company, Bisbee, Ariz., 500-kw. turbo-generator unit; Binghamton Light, Heat & Power Company, Binghamton, N. Y., 500-kw. turbo-generator unit. The following companies have 500-kw. Allis-Chalmers steam turbine units, either in shops or being erected: The Western United Gas & Electric Company, Aurora, Ill.; Meriden Electric Company, Meriden, Conn.; Canton Light, Heat & Power Company, Canton, Ohio; Interstate Railway Company, Wilmington, Del.; Savannah Lighting Company, Savannah, Ga.

Foundries.

The General Castings Company, Verona, Pa., has built a wing to its foundry which will be used as a core department, and in which a 30-ton Morgan electric traveling crane has been installed.

The Reading Iron Company, Reading, Pa., has acquired a plot of ground at Eighth and Green streets upon which it will build an erecting shop in connection with its Scott foundry department.

The Sintz-Walling Company, Grand Rapids, Mich., has been incorporated with a capital stock of \$60,000, \$51,500 of which is paid in. This organization is a combination of three companies, namely, Claude Sintz, Peninsular Motor Company and Peninsular Foundry Company. The new company, besides doing a general foundry business, will make a specialty of high grade gasoline marine engines and gas engine cylinder castings.

The foundry plant of the St. Paul Foundry Company, St. Paul, Minn., was recently damaged by fire, which destroyed the coreroms and entailed a loss of approximately \$10,000. The other departments were not affected, and the plant has continued in operation with but slight interruption.

The Nordeen Iron Works, Everett, Wash., has begun the erection of a new foundry, which it is expected will be completed by April 1. The necessary equipment for this addition has already been bought.

The foundry of the Hercules Iron & Supply Company, Anniston, Ala., has been purchased by the Union Foundry Company, and will be put in operation within the next 60 days. The Union Foundry Company has been incorporated with an authorized capital of \$100,000, and the following officers have been elected: H. A. Salzer, president; E. W. Kremers, vice-president,

and J. G. Kremers, secretary and treasurer. The Hercules Foundry has been idle for the last five years and will require extensive alterations and additional machinery to fit it for operation. Contracts for all necessary equipment have already been closed.

The Williams Foundry & Machine Company, Akron, Ohio, is replacing its foundry, which was recently burned, with a new brick building, 40 x 80 ft. None of the equipment was damaged beyond repair, and the company is not in the market for any new machinery.

Motors and Small Engines.

The Sibley-Houfley Machine Company, Detroit, Mich., has been incorporated with a capital stock of \$5000, and will manufacture automobile parts and gas engines. M. M. Sibley is president and treasurer; A. H. Sibley, secretary, and F. J. Houfley, vice-president and manager.

The Sterling Engine Company, Buffalo, N. Y., manufacturer of marine motors and gasoline engines for motor cars, has purchased a site on Niagara street, near Auburn avenue, upon which it is erecting a fireproof building 80 x 150 ft., two stories in height. The equipment will be new and up to date. The capital stock has been increased to \$75,000. C. A. Criqui has been elected president, U. S. Thomas, secretary and treasurer, and A. B. Schultz, superintendent.

Fires.

The white lead works of Wetherill & Bro., Philadelphia, Pa., was damaged \$50,000 by fire March 18.

Part of the plant of the General Chemical Company, Buffalo, N. Y., was destroyed by fire March 22, the loss being about \$50,000.

The pattern shop of the F. P. Lannon Foundry Company, Pueblo, Colo., was recently burned, the loss being about \$3000.

The recent fire at the plant of the Utica Pipe Foundry Company, Utica, N. Y., only burned the roof off of one of the buildings, and this is now being replaced.

The warehouse, with stock of new and second-hand machine tools, of the Baird Machinery Company, 2515-2523 Liberty avenue, Pittsburgh, was completely destroyed by fire on Saturday, March 23, the loss being fully covered by insurance. After the insurance has been adjusted the company will rebuild on the old site.

The entire plant of Barnes Lock & Foundry Company, Bayonne, N. J., has been destroyed by fire and the company has been dissolved. The business will be continued by H. J. Valentine Company, which will manufacture Barnes' night latches, locks and builders' hardware, brass and bronze yacht and boat hardware, steering wheels, &c. The new company has secured a building at 306-308 Grand street, Jersey City, which it is equipping with modern machinery and appliances, part of which is already installed.

Hardware.

The G. F. Barron Cooler Company, Granite Building, Rochester, N. Y., has recently been reorganized and the capital increased to meet the demands of a growing business. The plant, which continues at Palmyra, N. Y., will gradually be enlarged. The Barron water cooler made by the company is referred to as entirely sanitary, as no ice or outside air comes in contact with the water, while it also effects a considerable saving in ice bills.

The new plant of the Lloyd Mfg. Company, Menominee, Mich., formerly of Minneapolis, Minn., which has lately been incorporated with a capital of \$400,000, consists of three one-story brick buildings, concrete foundations, each building 70 x 400 ft., giving a floor space of something like 85,000 sq. ft., with independent power plant and dry kilns. It has been the company's aim to have the plant modern in every respect, installing electrical power, with individual motors for the different machines, electric lighted throughout, with the latest approved factory telephone system, heat being furnished by the Warren-Webster vacuum system or overhead piping. The company's line is wheeled vehicles for children, wire specialties and the Lloyd automatic wire mattress weavers are also manufactured. The installation of machinery has recently been completed and about 300 people are employed at the present time. The company is nearly 60 days behind on orders and is operating 13½ hr. per day.

Miscellaneous.

The Baker-Churchill Company, Detroit, Mich., recently incorporated with a capital of \$45,000, will engage in the manufacture of oil pumps and oiling devices, of which a force feed oil pump of special design will constitute its specialty.

A large shipment of vises was recently made to the Texas Central Railway Company by the Pittsburgh Automatic Vise & Tool Company, Pittsburgh. These tools are designed for harder service than is usually encountered in the average railroad shops, but this company builds vises especially adapted for such work and service. The great increase in output of vises by the company permits it to make prompt shipments on all orders regardless of size or style of tool, and it is now endeavoring to stock up its branches in different cities with vises, in order to overcome any delays which may be occasioned by inadequate transportation facilities.

The Pope Mfg. & Construction Company, Fond du Lac, Wis., manufacturer of boats, has amended its articles of incorporation by changing its name to the Pope Boat Company and increasing its capital from \$4500 to \$25,000. The company is planning extensive additions to its plant and will manufacture on a larger scale than ever.

The Florida Ornamental Iron Works, Jacksonville, Fla., recently incorporated with a capital stock of \$20,000, has installed a plant where it will manufacture ornamental and architectural iron work, making a specialty of iron fences, gates and fire escapes. D. L. Rathbone is president; J. J. McNamara, vice-president, and J. S. Zeller, secretary and treasurer. F. H. Cooper, formerly connected with the Buffalo Iron Works, is general manager.

The Star Corundum Wheel Company, Detroit, Mich., is now located in its new plant on Calvary avenue, which is completely equipped with modern machinery and appliances for the manufacture of abrasive wheels. The building is of steel and concrete construction, and is located on the Wabash and Pere Marquette railroads, which furnish unexcelled shipping facilities. With its new plant in operation the company is in a better position to fill orders promptly, and as the vitrified, silicate and elastic processes are employed, the company is enabled to meet the requirements of all users of abrasive wheels. The vitrified wheel department is under the management of J. C. Linden, formerly of the Abrasive Material Company, Philadelphia, Pa.

The Canton Brass Company has been organized at Canton, Ohio, with a capital of \$20,000, the incorporators being Gordon M. Mather, C. A. Dougherty, John J. McMahon, C. W. Kepfinger and C. S. Renkert.

The Duer-Elderkin Spring & Mfg. Company, with works and offices at Twenty-sixth street and Liberty avenue, Pittsburgh, is much crowded for room and is having a heavy increase in its business, making it necessary to provide for a larger output. For this purpose a plot of ground has been bought at McKees Rocks, Pittsburgh, having direct connection with the Pittsburgh, Chartiers & Youghiogheny Railroad, on which will be erected a one-story building, 50 x 140 ft., which is expected to be ready to occupy in May. The company manufactures elliptical springs and will maintain hot and cold departments, adding some new modern machinery to the latter.

The Seaman-Sleeth Company's Enlargements.

The Seaman-Sleeth Company, Pittsburgh, manufacturer of rolls exclusively, has purchased a piece of ground 150 x 380 ft., located across the street from its present plant, on which it will erect a steel building, brick inclosed, with slate roof, measuring 40 x 150 ft., the contract for which has been placed with the Eastern Steel Company, Pottsville, Pa. This building will be used as a machine shop, and will be equipped with a 30-ton electric crane for handling heavy work, and also modern machine tools, motor driven, of the same type as were recently installed in the company's iron plant.

The erection of another steel building is in contemplation, to contain two 25-ton open hearth steel furnaces and a foundry. The pattern shop of the present plant is now being dismantled and the ground will be used for a crane runway, a contract having been placed with the Eastern Steel Company for a runway 92 ft. span by 320 ft. long, which will have a 35-ton electric crane to serve the storage yard. These additions and improvements were made necessary by the increasing demand which the Seaman-Sleeth Company is having for rolls, and also to enable it to manufacture all sizes of steel rolls. It is expected to have these new additions in operation early in the summer.

The Fair Haven Iron Ore Company has been carrying on iron mining operations near Sterling, Cayuga County, N. Y., for the past few months. Considerable machinery has been purchased, and the work of opening the deposit has been carried on under the direction of John F. Bauchelle. A steam stovel is now at work in an open pit, and some trial shipments of the ore have been made to eastern Pennsylvania. The officers of the Fair Haven Iron Ore Company are: James P. Whipple, Albany, N. Y., president; W. H. Lyon, Albany, N. Y., vice-president; B. H. Davis, Elmira, N. Y., treasurer.

The Capell Fan & Engineering Company has removed its office from 1426 Farmers' Bank Building to 603 Lewis Building, Pittsburgh.

New Publications.

Steam Turbines, Practice and Theory. By Lester G. French. Size, 6 x 9 in.; pages, 418; illustrations, 250. Cloth. Price, \$3. Publisher, the Technical Press, Battleboro, Vt.

To many the steam turbine is a mysterious machine to be understood only by those deeply versed in science and mathematics. This wrong impression has been created partly by the unfortunate way in which it has been presented to the public through catalogues and books which have so far appeared on the subject. The simple manner in which the principles are described in Mr. French's new book disposes of the difficulties which have heretofore perplexed the layman, and reveals the turbine as a direct, consistent and surprisingly simple form of steam prime mover. Herein lies an important value of the book. It acquaints the novice with the development of the turbine from its original forms, which have passed into history, down to the most recent designs, and points out the differences in the general classifications into which all turbines may be divided—simple impulse, compound impulse, reaction and miscellaneous. Examples of note in each class are described as the De Laval, Rateau, Riedler-Stumpf, Zoelly, Richards, Levin and Kerr of the first class; the Rateau, Zoelly, Holzwarth, Curtis, Riedler-Stumpf and General Electric of Germany of the second class; the Parsons' types as made by the Westinghouse Machine Company, Brown, Boveri & Cie and the Allis-Chalmers Company, all reaction turbines, and the Crocker-Warren, Union, Sulzer, Lindmark and Curtis machines, each of more or less special classification.

The author, for nine years editor of *Machinery*, had an excellent chance of accumulating the data that has made this work possible, and with that experience and the special study he has devoted to it since has evolved a treatise that may worthily be regarded a standard reference, not alone on the development of what has proved commercially correct in turbine design, but also on the points to avoid, as the book treats of features that have failed, why they failed, and why they can never be hoped to be a part in a commercially successful machine.

For those who would have more than a merely mechanical understanding of the turbine the author has devoted six chapters on the thermodynamic phase of its problems, which deal of the properties of steam, the temperature-entropy diagram, the flow of steam through orifices and nozzles, and the adiabatic flow of steam. In another chapter a most useful part is a table comparing steam turbine and reciprocating engine performance, based on authoritative tests. Altogether it gives the skeptical a very fair chance to draw their own conclusions, but the author for his part makes no concealment of his belief in the ultimate supremacy of the steam turbine, and commits himself as an advocate of it.

Alumenum Coated Sheets.—A comparatively new product, named Alumenum coated steel sheets, is now coming into prominence for a large number of purposes for which sheet metal work is used. This material stands relatively between galvanized iron and copper, being better, it is said, than the galvanized iron and not as expensive as sheet copper. It has been tested for some years under most trying conditions with highly satisfactory results. The two most important qualities in sheet metal working are fully met, in that it will double seam without scaling and will solder freely. Alumenum coated sheets are used largely for tanks of various kinds, reservoirs, boilers, furnace and smoke pipe, oven linings, flues, &c. In the automobile trade its use for hoods, fenders, and bodies as well as for cylinder jackets and various other parts is becoming quite large. These sheets are rustproof, retain their color, and the coating will not peel off, even when subjected to a high degree of heat. The Merchant & Evans Company, Philadelphia, is placing on the market the original Alumenum coated steel sheets, which it is making in all gauges from Nos. 10 to 30, standard sizes being kept in stock, while special sizes are made to order.

San Francisco's Lumber Trade Threatened.

SAN FRANCISCO, March 19, 1907.—We are now threatened with a lumber famine that may last for months and which it is feared may seriously embarrass the building trades. The laborers in the mills on Puget Sound, who have been getting \$2.25 per day, demand \$2.50. They have threatened to strike if the demand be not granted. As an answer to this the manufacturers have decided to close down all the mills. There are 27 of them, with headquarters in this city, and their withdrawal from the field will leave us with a scant supply indeed. It would leave us with only the red wood supply, which would be not over 30 per cent. of the wants of the city at the present time. Of course, if the trouble were confined to the manufacturers and their men it might be borne more easily, but it extends to every line of business engaged in the rebuilding of the city and will affect the country as well as the city—all California north of Tehachapi. Everywhere that Oregon pine is used there will be a lumber famine and, of course, this will cut short temporarily the demand for everything in the line of building hardware. Business in this line has not been good since the first of the year on account of the rains stopping outside building operations, and now that spring is here and rains may be expected to cease this strike comes on. The strike threatens to be a serious one for many lines of trade. It would add nearly 30 per cent. to the cost of labor employed in the mill, and there would be a prolonged struggle, causing great loss to both sides and damage to trade. But for this the outlook for the hardware and iron trade would be better than for a long time.

Much of the iron and steel injured in the fire is being utilized in the same buildings instead of being sold as scrap. In this way a large amount of money will be saved, as the value of scrap here has been equal to that of pig iron. Many small fortunes will be made by those who have purchased the metal scrap found in the debris from the insurance companies or owners of the buildings. There are great piles of it in some places, but the great part is still as it fell or as it was left by those who wrecked the buildings. It will take a long time to remove all of it.

The outlook for crops is very good, and we shall probably have a large yield of wheat, barley, fruit and vegetables. The red wood millmen are making more lumber than ever, while there will be a very large output of sugar and white pine. For the months of January and February the shipments from the red wood mills were almost quite as large as for the same time last year. The product of the oil wells is also large and the price is high. So when the threatened Oregon pine lumbermen's strike has ceased to trouble us the prospects for the rest of the year will be very good indeed.

The export trade in articles of iron and steel has been light thus far in the present year, especially to China and Japan, as compared with what it has been. The falling off in shipments to Japan is, of course, a direct result of the close of the war, as most of the business during the war was in articles calculated to help out the Japanese in the contest. There has been a fair amount of business done with Mexico and a comparatively small amount with other Spanish-American countries. Shipments to Australia and New Zealand have not been large.

J. O. L.

The W. G. Wilkins Company, engineer and architect, Westinghouse Building, Pittsburgh, is supervising the erection of a gas producer plant to be built for the Pittsburgh Forge & Iron Company, at its Allegheny Works. The contract for a steel building, 25 x 135 ft., has been awarded to the N. D. Yant Company, Allegheny, and six Forter-Miller gas producers are to be installed, together with a Bollinger Brothers coal conveying and elevator system. The plant is to be in operation by July 1.

Witherbee, Sherman & Co., Incorporated, Port Henry, N. Y., have just completed a shipment of specially concentrated Harmony ore, which averaged 71.20 per cent. of metallic iron.

The Iron and Metal Trades

So far as the current movement in crude and finished Iron products is concerned the situation is practically unaffected by the recent events in Wall Street and the numerous announcements of a proposed cessation of railroad work. It is idle to deny, however, that unless there is a resumption of that work during the next few months consumption of Iron and Steel must be affected and values must be influenced. It has already had the effect of making buyers of crude Iron and Steel more cautious as to commitments for the last half of the year.

Relatively speaking, when comparing it with the tonnage booked, the quantities of material for which delays in deliveries have been asked are insignificant, and the quantity of orders canceled is extremely small.

It will take months to judge whether the tremendous impulse under which we are now working will be affected only to the point of causing us to return to normal conditions. In the meantime the all-absorbing desire is to catch up with back orders, and nearly everything seems to conspire to thwart efforts in that direction.

On the whole the buying of Pig Iron has been rather light, and in at least one case an important inquiry for Foundry Iron was withdrawn. About 8000 tons of the Foundry Iron reported last week to have been sold to a large melter turns out to have been Middlesbrough. We understand that during the last week a cargo of close to 5000 tons of Scotch Iron was purchased abroad by an American importer to cover sales here previously made. The Middlesbrough market has declined to 53 shillings 3 pence.

A very curious incident is the offering, for shipment from Shanghai, of a lot of 5000 tons of Basic Pig Iron made in China. The analysis is a very good one, the Iron being guaranteed under 0.05 in sulphur, 0.70 in silicon and 0.30 in phosphorus. It is offered for shipment to arrive here, 2500 tons in June and 2500 tons for the third quarter. The price is at a figure which may prove attractive.

Upward of 4000 tons of Ferromanganese has been sold at about \$67, delivered, for the second half of 1907. Nearly all the important Steel works east of the Allegheny Mountains were among the purchasers.

In the Central West the scarcity of Steel continues. One large Steel interest in the Pittsburgh District is now in the market for important quantities to cover a shortage in supplies for April and May delivery.

Quite a large tonnage of Structural Material is in sight. Thus Salt Lake City has work in hand aggregating over 15,000 tons, of which about 3000 tons has already been contracted for. There is good work coming up, too, from nearly every important Pacific Coast city, and Chicago is expected to call for considerable quantities soon.

In the South, 4000 tons for a coaling station at Sewell's Point, Va., is the largest individual contract placed.

In the Tube, Sheet and Bar trades the volume of business is beyond precedent, and the Wire trade is heavy.

Chicago opens bids this week for 12,000 tons of Cast Iron Water Pipe. Detroit has just placed 6000 tons, and minor quantities have been sold at Ohio points.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type,
Declines in Italics.

At date, one week, one month and one year previous.

	Mar. 27, 1907.	Mar. 20, 1907.	Feb. 27, 1907.	Mar. 28, 1906.
PIG IRON, Per Gross ton:				
Foundry No. 2, Standard, Philadelphia.....	\$24.25	\$25.25	\$25.50	\$18.25
Foundry No. 2, Southern, Cincinnati.....	26.00	26.00	26.00	16.50
Foundry No. 2, Local, Chicago.....	26.00	26.00	25.50	19.00
Bessemer, Pittsburgh.....	22.85	22.85	22.85	18.25
Gray Forge, Pittsburgh.....	21.60	21.75	21.85	16.85
Lake Superior Charcoal, Chicago.....	26.50	26.50	27.00	19.75
BILLETS, &c., Per Gross Ton:				
Bessemer Billets, Pittsburgh.....	29.00	29.00	29.50	27.00
Forging Billets, Pittsburgh.....	36.00	36.00	36.00	32.00
Open Hearth Billets, Phila.....	32.00	33.00	33.00	29.00
Wire Rods, Pittsburgh.....	37.00	37.00	37.00	34.00
Steel Rails, Heavy, Eastern Mill.....	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross ton:				
Steel Rails, Melting, Chicago.....	18.00	18.00	18.00	13.50
Steel Rails, Melting, Phila.....	19.25	19.25	19.50	17.00
Iron Rails, Chicago.....	25.00	25.00	25.00	20.50
Iron Rails, Philadelphia.....	27.00	27.00	27.00	21.50
Car Wheels, Chicago.....	24.00	24.00	23.00	18.00
Car Wheels, Philadelphia.....	24.00	24.00	23.25	17.00
Heavy Steel Scrap, Pittsburgh.....	18.00	18.00	18.00	14.50
Heavy Steel Scrap, Chicago.....	16.00	16.00	15.50	13.50
Heavy Steel Scrap, Philadelphia.....	18.75	18.75	19.00	16.50
FINISHED IRON AND STEEL,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia.....	1.93½	1.93½	1.93½	1.73½
Common Iron Bars, Chicago.....	1.81½	1.81½	1.81½	1.71½
Common Iron Bars, Pittsburgh.....	1.80	1.80	1.80	1.60
Steel Bars, Tidewater, New York.....	1.74½	1.74½	1.74½	1.64½
Steel Bars, Pittsburgh.....	1.60	1.60	1.60	1.50
Tank Plates, Tidewater, New York.....	1.84½	1.84½	1.84½	1.74½
Tank Plates, Pittsburgh.....	1.70	1.70	1.70	1.60
Beams, Tidewater, New York.....	1.84½	1.84½	1.84½	1.84½
Beams, Pittsburgh.....	1.70	1.70	1.70	1.70
Angles, Tidewater, New York.....	1.84½	1.84½	1.84½	1.84½
Angles, Pittsburgh.....	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh.....	1.90	1.90	1.85	1.57½
Skelp, Sheared Steel, Pittsburgh.....	2.00	2.00	1.95	1.60
SHEETS, NAILS AND WIRE,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh.....	2.50	2.50	2.50	2.25
Wire Nails, Pittsburgh.....	2.00	2.00	2.00	1.85
Cut Nails, Pittsburgh.....	2.05	2.05	2.05	1.80
Barb Wire, Galv., Pittsburgh.....	2.45	2.45	2.45	2.30
METALS, Per Pound:				
Lake Copper, New York.....	25.25	25.50	25.12½	18.62½
Spelter, New York.....	6.85	6.95	7.00	6.15
Spelter, St. Louis.....	6.65	6.80	6.77½	6.05
Lead, New York.....	6.25	6.30	6.35	5.35
Lead, St. Louis.....	6.05	6.10	6.10	5.27½
Tin, New York.....	40.35	40.65	41.90	37.45
Antimony, Hallett, New York.....	23.00	23.00	24.50	17.00
Nickel, New York.....	45.00	45.00	45.00	40.00
Tin Plate, 100 lb., New York.....	\$4.00	\$4.00	\$4.00	\$3.69

Chicago.

FISHER BUILDING, March 27, 1907.—(By Telegraph.)

Finishing mills are running full in all departments, and specifications against contracts are being freely furnished in practically all lines. Without the accession of any notably large contracts to swell the volume of business offered, there is a large aggregate tonnage of Structural Material being offered, and mill capacities are fully engaged. Plate, Sheet and Pipe deliveries, already badly delayed, have suffered further complications from the interruption of mill operations occasioned by recent floods, and distinct improvement in this respect is not to be immediately expected. No new features have been injected into the Pig Iron situation, save that the recent temporary curtailment of production through damage to stocks from high water, and the blowing out of a number of furnaces for relining have added to the firmness of the sellers' position. The market is barren of transactions that would indicate the beginning of an early buying movement covering last half requirements. There are, however, a number of sales confined mainly to lots of 200 to 500 tons for the second and third quarter of the year. Whether the freight rate from Southern points to the Ohio River shall be advanced on April 1 according to schedule is to be discussed and determined at a meeting of Southern railroad managers to be held at Louisville, Ky., March 28. Representatives of shipping interests will attend this meeting.

Pig Iron.—There is no evidence of appreciable change in the relative position of buyers and sellers in the Pig Iron market. A few inquiries for flexible tonnage for second half

delivery have appeared, but no considerable sales have resulted therefrom, indicating that the consumers are not satisfied that the present prices for forward deliveries will hold. One inquiry for 4500 tons of Southern Basic, 1500 tons for delivery in the third and 3000 for delivery in the last quarter, is reported. There is some trade in Southern spot Iron, which on track or in transit brings higher prices than ever, while sales of small lots of No. 2 Northern have been made at \$25.50 to \$26 for spot shipment. Prices for the different delivery periods are the same as reported last week, \$21.50, Birmingham, being quoted for No. 2 for second quarter, and from \$18.50 to \$19 is still held by the principal furnaces for the third quarter and second half. Northern furnace interests have not receded from their firm attitude, and are asking \$23.50 to \$24 furnace for second half deliveries. While it may be affirmed that the situation is unchanged throughout, there is unquestionably a feeling of greater strength on the part of sellers. At a meeting of managers of the Southern railroads, to be held at Louisville, Ky., March 28, the question of further postponement of the proposed 25 cents advance in rates to the Ohio River, scheduled to become effective April 1, will be determined. The following quotations are for April, May and June shipments, including the 25c. advance in freight rate on Southern Irons, effective April 1:

Lake Superior Charcoal.....	\$26.50 to \$27.00
Northern Coke Foundry, No. 1.....	26.50 to 27.00
Northern Coke Foundry, No. 2.....	26.00 to 26.50
Northern Coke Foundry, No. 3.....	25.50 to 26.00
Northern Scotch, No. 1.....	26.00 to 27.00
Ohio Strong Softeners, No. 1.....	26.00 to 26.50
Ohio Strong Softeners, No. 2.....	25.50 to 26.00
Southern Coke, No. 1.....	26.35 to 27.10
Southern Coke, No. 2.....	25.85 to 26.35
Southern Coke, No. 3.....	25.35 to 25.85
Southern Coke, No. 4.....	24.85 to 25.35
Southern Coke, No. 1 Soft.....	26.35 to 26.85
Southern Coke, No. 2 Soft.....	25.85 to 26.35
Southern Gray Forge.....	21.85 to 22.35
Southern Mottled.....	21.85 to 22.35
Malleable Bessemer.....	26.50 to 27.00
Standard Bessemer.....	25.30 to 25.80
Jackson Co. and Kentucky Silvery, 6 %	30.30 to 30.80
Jackson Co. and Kentucky Silvery, 8 %	32.30 to 32.80
Jackson Co. and Kentucky Silvery, 10 %	34.30 to 34.80

Metals.—Notwithstanding the reported decline in Copper, holders in this market maintain prices at practically the same level that has ruled for several weeks. A slightly easier tone is noted in Pig Tin, which is shaded off a little better than 1c. Quite a number of inquiries were precipitated by the reported slump in Copper, which, being met by firm quotations, were fruitless of results. We quote as follows: Casting Copper, 26½c. to 27c.; Lake, 27c. to 27½c., in car lots for prompt shipment; small lots, ¼c. to ½c. higher; Pig Tin, car lots, 43c.; small lots, 44c.; Lead, Desilverized, 6.50c. to 6.60c., for 50-ton lots; Corroding, 7.25c. to 7.35c., for 50-ton lots; on car lots, 2¼c. per 100 lb. higher; Spelter, 7¼c.; Cookson's Antimony, 28½c., and other grades, 26½c. to 27½c.; Sheet Zinc is \$8.50 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 20c.; Heavy Copper Wire, 20c.; Copper Bottoms, 18½c.; Copper Clips, 19c.; Red Brass, 18½c.; Red Brass Borings, 16½c.; Yellow Brass, 15½c.; Yellow Brass Borings, 13½c.; Light Brass, 12½c.; Lead Pipe, 5.25c.; Tea Lead, 4¼c.; Zinc, 4¼c.; Pewter, No. 1, 25c.; Tin Foil, 31½c.; Block Tin Pipe, 27½c.

Old Material.—Very little movement is observed in Scrap, and stocks in the hands of dealers are accumulating. There is more or less demand for Cast Scrap, but the supply of the best foundry mixers is limited. Wrought Scrap moves slowly, the demand from mills being very light. But little change in prices is reported. Railroad offerings this week include lists from the Grand Trunk of 1400 tons, and the Chicago, Milwaukee & St. Paul of 1000 tons. The following quotations are per gross ton, f.o.b. Chicago:

Old Iron Rails.....	\$25.00 to \$26.00
Old Steel Rails, 3 ft. and over.....	19.00 to 19.50
Old Steel Rails, less than 3 ft.....	18.00 to 18.50
Relaying Rails, standard sections, subject to inspection.....	31.00 to 32.00
Old Car Wheels.....	24.00 to 24.50
Heavy Melting Steel Scrap.....	16.00 to 16.50
Frogs, Switches and Guards.....	16.50 to 17.50
Mixed Steel.....	12.50 to 13.00

The following quotations are per net ton:

Iron Fish Plates.....	\$19.50 to \$20.50
Iron Car Axles.....	26.50 to 27.00
Steel Car Axles.....	21.50 to 22.00
No. 1 Railroad Wrought.....	15.25 to 15.75
No. 2 Railroad Wrought.....	14.25 to 14.75
Railway Springs.....	15.00 to 15.50
Locomotive Tires, smooth.....	17.00 to 17.50
No. 1 Dealers' Forge.....	12.00 to 12.50
Mixed Rushing.....	11.00 to 11.50
Iron Axle Turnings.....	11.50 to 12.00
Soft Steel Axle Turnings.....	11.50 to 12.00
Machine Shop Turnings.....	11.50 to 12.00
Cast Borings.....	9.25 to 9.75
Mixed Borings, &c.....	9.00 to 9.50
No. 1 Mill.....	10.00 to 10.50
No. 2 Mill.....	9.00 to 9.50
No. 1 Boilers, cut to Sheets and Rings.....	11.50 to 12.00
No. 1 Cast Scrap.....	19.00 to 20.00
Stove Plate and Light Cast Scrap.....	15.50 to 16.00
Railroad Malleable.....	16.50 to 17.00
Agricultural Malleable.....	15.00 to 16.00

(By Mail.)

Billets and Rods.—With no apparent increase in the supply of Rods and ready takers for all lots offered, conditions remain unchanged. Each individual sale seems to be priced according to the immediate circumstances surrounding it, but the range for usual transactions is from \$36 to \$37. There is a good demand for Forging Billets, which continue to command \$38 and upward, according to size.

Rails and Track Supplies.—Quite a number of inquiries for Traction Rails have appeared in the market, but have resulted in few orders being placed. The demand for Track Supplies is good, and prices are well maintained. We quote as follows: Angle Bars, accompanying Rail orders, 1907 delivery, 1.65c.; car lots, 1.90c. to 1.95c.; Spikes, 2.40c. to 2.50c., according to delivery; Track Bolts, 2.75c. to 2.85c., base, Square Nuts, and 2.90c. to 3c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 30 to 45 lb. sections, \$35; 25-lb., \$36; 20-lb., \$37; 16-lb., \$38; 12-lb., \$39, f.o.b. mill. Standard Sections, \$28, f.o.b. mill, full freight to destination.

Structural Material.—With an increasing volume of specifications and a large number of small orders, which in the aggregate furnish a very considerable tonnage, deliveries in Structural Shapes are slowly becoming more extended. The fact that mill order books are being filled with increasing tonnage, made up of small orders, is taken as significant of a sound and healthy condition in industrial affairs generally. The Standard Car Works is now asking for deliveries for its new plant, which is expected to be ready for operation some time in June. Specifications for the Taft-Pennoyer Building, Oakland, Cal., amounting to 1800 tons, have been furnished. Prices from store are quoted without change, at 2.05c. to 2.10c., and mill prices are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.86½c.; Angles, 3 to 6 in., ¼-in. and heavier, 1.86½c.; larger than 6 in. on one or both legs, 1.96½c.; Beams, larger than 15 in., 1.96½c.; Zees, 3 in. and over, 1.86½c.; Tees, 3 in. and over, 1.91½c., in addition to the usual extras for cutting to extra lengths, punching, coping, bending and other shop work.

Plates.—No progress has so far been made in relieving the overcrowded condition of the mills. While new business is, perhaps, not being offered quite so freely, specifications are not lagging. Mills in position to furnish shipment in four to six weeks are asking premiums of \$1 to \$4 a ton over 1.70c., Pittsburgh. We quote for future deliveries as follows: Tank Plate, ¼-in. and heavier, wider than 6¼ and up to 100 in. wide, inclusive, car lots, Chicago, 1.86½c. to 2.06½c.; 3-16 in., 1.96½c. to 2.16½c.; Nos. 7 and 8 gauge, 2.01½c. to 2.21½c.; No. 9, 2.11½c. to 2.31½c.; Flange quality, in widths up to 100 in., 1.96½c. to 2.06½c., base, for ¼-in. and heavier, with the same advance for lighter weights; Skerch Plates, Tank quality, 1.96½c. to 2.16½c.; Flange quality, 2.06½c. Store prices on Plates are as follows: Tank Plate, ¼-in. and heavier, up to 72 in. wide, 2.20c. to 2.30c.; from 72 to 96 in. wide, 2.30c. to 2.40c.; 3-16 in. up to 60 in. wide, 2.30c. to 2.40c.; 72 in. wide, 2.55c. to 2.65c.; No. 8, up to 60 in. wide, 2.35c. to 2.45c.; Flange and Head quality, 0.25c. extra.

Sheets.—The delay occasioned by the recent stoppage of Pittsburgh mills by high water, though not of long duration, has added to an already complicated situation. Much complaint is heard on account of slowness of deliveries, for which no immediate improvement is promised. There is an especially strong demand for Galvanized Sheets, which for prompt needs can now be obtained only from store stocks. No change in prices are reported. We quote as follows: Blue Annealed, No. 10, 2.01½c.; No. 12, 2.06½c.; No. 14, 2.11½c.; No. 16, 2.21½c.; Box Annealed, Nos. 17 to 21, 2.51½c.; Nos. 22 to 24, 2.56½c.; Nos. 25 and 26, 2.61½c.; No. 27, 2.66½c.; No. 28, 2.76½c.; No. 29, 2.86½c.; No. 30, 2.96½c.; Galvanized Sheets, Nos. 10 to 14, 2.81½c.; Nos. 15 and 16, 3.01½c.; Nos. 17 to 21, 3.16½c.; Nos. 22 to 24, 3.31½c.; Nos. 25 and 26, 3.51½c.; No. 27, 3.71½c.; No. 28, 3.91½c.; No. 30, 4.41½c.; Sheets from store: Blue Annealed, No. 12, 2.30c.; No. 14, 2.35c.; No. 16, 2.45c.; Box Annealed, Nos. 18 to 21, 2.70c.; Nos. 22 to 24, 2.75c.; No. 26, 2.80c.; No. 27, 2.85c.; No. 28, 2.95c.; No. 30, 3.35c.; Galvanized from store: Nos. 10 to 20, 3.30c. to 3.35c.; Nos. 22 to 24, 3.55c. to 3.60c.; No. 26, 3.65c. to 3.70c.; No. 27, 3.85c. to 3.95c.; No. 28, 4.15c.; No. 30, 4.65c. to 4.70c.

Bars.—Steel Bars are in good demand, and in addition to a free offering of specifications there is a considerable amount of new business developing, though in comparatively small tonnage lots. The demand for Iron Bars has for the past week been a little quiet. Prices are unchanged and quotations are as follows: Iron Bars, 1.81½c. to 1.86½c.; Steel Bars, 1.76½c., both half extras; Hoops, 2.16½c., extras as per Hoop card; Bands, 1.76½c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.86½c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

Merchant Pipe.—After a stoppage of about 10 days,

caused by recent floods, the mills of the National Tube Company have again resumed operations. Though the delay was of short duration, its effects are keenly felt by many consumers, whose overdue orders were still further delayed. Prices being withdrawn and no orders accepted for shipment prior to June 1, business offered for shipment subsequent to that date is booked at the discretion of the company, and at prices to be named June 1. Other mills are heavily loaded with orders and there is therefore a lack of uniformity in prices, which makes it impossible to quote discounts for universal application. Prompt shipments are difficult to obtain from any source, and when supplied command premiums, usually at the discretion of the seller. As representing an average level of prices, we quote for Black Steel Pipe, on base sizes, $\frac{3}{4}$ to 5 in., 72.35; Galvanized, 62.35, carload lots, Chicago. From store in small lots, Chicago jobbers quote 70 per cent. on Black Steel Pipe, $\frac{3}{4}$ to 6 in. About 4 points advance above these prices is asked for Iron Pipe.

Boiler Tubes.—Although the burden of supply, by the temporary withdrawal from the market of the National Tube Company, has been thrown upon the outside mills, it is still possible to get reasonably prompt shipment of Merchant Tubes from some sources. Premiums are, however, being asked and in some cases paid, but the discounts quoted, though nominal, are believed fairly to represent the market for average specifications and deliveries. Mill quotations on the base sizes are as follows: $2\frac{3}{4}$ to 5 in., in carload lots, Steel Tubes, 63.35; Iron, 50.35; Seamless, 49.35; $2\frac{1}{2}$ in. and smaller, and lengths over 18 ft., and $2\frac{1}{2}$ in. and larger, and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to $1\frac{1}{2}$ in.....	35	35	35
$1\frac{1}{2}$ to $2\frac{1}{4}$ in.....	50	35	35
$2\frac{1}{4}$ in.....	52 $\frac{1}{2}$	35	35
$2\frac{3}{4}$ to 5 in.....	60	47 $\frac{1}{2}$	47 $\frac{1}{2}$
6 in. and larger.....	50	35	..

Merchant Steel.—Nothing out of the ordinary run of business is noted, though the volume of orders is satisfactory and prices are firmly held. Prices are unchanged and are as follows: Planished or Smooth Finished Tire Steel, 1.96 $\frac{1}{2}$ ¢; Iron Finish, up to $1\frac{1}{2}$ x $\frac{1}{2}$ in., 1.91 $\frac{1}{2}$ ¢; Iron Finish, $1\frac{1}{2}$ x $\frac{1}{2}$ in. and larger, 1.76 $\frac{1}{2}$ ¢, base; Channels for solid rubber tires, $\frac{3}{4}$ to 1 in., 2.26 $\frac{1}{2}$ ¢, and $1\frac{1}{2}$ -in. and larger, 2.16 $\frac{1}{2}$ ¢; Smooth Finished Machinery Steel, 2.16 $\frac{1}{2}$ ¢; Flat Sleigh Shoe, 1.91 $\frac{1}{2}$ ¢; Concave and Convex Sleigh Shoe, 2.06 $\frac{1}{2}$ ¢; Cutter Shoe, 2.45¢; Toe Calk Steel, 2.31 $\frac{1}{2}$ ¢; Railroad Spring, 1.96 $\frac{1}{2}$ ¢; Crucible Tool Steel, 6 $\frac{1}{2}$ ¢ to 8¢, and still higher prices are asked on special grades. Shafting, 50 per cent. off in car lots and 45 per cent. in less than car lots, base territory.

Cast Iron Pipe.—No inquiries involving large tonnages are reported in the market, and trade is generally quiet, being confined to smaller requirements for extension work. Contracts have been let to the American Car & Foundry Company by the city of Detroit, Mich., for 6000 tons, and Toledo, Ohio, for 500 tons; also 1000 tons by the city of Dayton, Ohio, which was secured by the United States Cast Iron Pipe & Foundry Company. We quote as follows: Water Pipe, 4-in., \$38 to \$39; 6 to 12 in., \$37 to \$38; 16-in. and up, \$36 to \$37, with \$1 extra for Gas Pipe.

Coke.—Only a moderate amount of business is being booked and lower prices are ruling. We quote 72-hr. Connellsville Coke for prompt shipment at \$3.60 per car lot at ovens; Solvay Coke, \$6.75, f.o.b. Chicago, prompt delivery.

Birmingham.

BIRMINGHAM, ALA., March 23, 1907.

Pig Iron.—While the continued unsettled condition of the stock market may possibly have had the effect of making some buyers hesitate about placing orders, quite a number of small contracts which have been pending were closed up during the past week. The producers do not seem at all alarmed over the situation and are holding firm for the prices heretofore prevailing, and in some instances prices have been advanced. During the past few days inquiries for spot Iron have become more numerous, but only a limited quantity of the higher grades is to be had. Several sales of 1000 ton lots of Forge and Mottled are reported at the usual differential. No. 2 Soft for prompt shipment can usually be had at \$22.50, but on single carloads, already in cars, a premium is frequently paid. For second quarter \$21.50 to \$22, depending on the delivery desired, is readily obtained. For third quarter shipment \$18.50 Iron is becoming very scarce, practically all the furnaces asking \$19 for this delivery, but on contracts extending through the entire last half \$18.50 can still be done. The statement that Southern Iron for the last half has been sold at \$18 is denied by the producers here. The increase in production of Pig Iron which was expected in this district this year has not materialized. The furnace of the Woodstock Iron & Steel Corporation was blown in this week, but this is more than offset by the blowing out of Woodward Iron Company's No. 3 furnace the latter part of last week. This

latter stack is one of the largest in the district and will probably be out of commission for 60 days or longer. Inability to secure a regular or sufficient supply of raw material is causing bad runs and restricting production, and few of the furnaces figure on having any No. 2 Soft, in addition to that already sold, to offer for second quarter. The car situation is improving, but little if any of the accumulation of Iron on the yards has been moved, the equipment now being furnished being only about sufficient to move current production. Nothing more has been given out regarding the advance of 25¢ per ton in freight rates scheduled to go into effect April 1, but, inasmuch as the date has already been twice postponed, it is possible that it may be deferred again.

Cast Iron Pipe.—The city of Chicago is expected to open bids next week for 12,000 tons of Water Pipe. This is the only letting of any size in the near future in which Southern manufacturers are interested. Practically all the business now being placed is for small amounts, but these orders are so numerous that in the aggregate the tonnage is considerably more than the current production. Prices on Water Pipe are unchanged, and are about as follows per net ton: 4 to 6 in., \$35; 8 to 12 in., \$33; over 12 in. average, \$31, with \$1 per ton extra for Gas Pipe.

Prices on Cast Iron Soil Pipe have been advanced by the manufacturers here about \$3 per ton, and on Fittings \$5 per ton. Owing to labor troubles the demand is far in excess of the supply. At this season of the year manufacturers usually have accumulated large stocks, but, owing to the mild winter and unprecedented demand, they are now starting into the busy season with depleted stocks and with every prospect of production decreasing as the weather becomes warmer.

Old Material.—The demand for Machinery Cast and Stove Plate Scrap is far in excess of the supply, and prices have been advanced accordingly. There is also an improvement in the demand for No. 1 Wrought within the past few days, and some very satisfactory contracts have been closed. The general feeling among dealers is much better than during the past three or four weeks, and the market is decidedly stronger than for some time. Dealers' quotations per gross ton f.o.b. cars here are revised as follows:

Old Iron Rails.....	\$22.00 to \$22.50
Old Iron Axles.....	18.50 to 19.00
Old Steel Axles.....	16.50 to 17.50
No. 1 Railroad Wrought.....	19.00 to 19.50
No. 2 Railroad Wrought.....	13.50 to 14.00
No. 1 Country Wrought.....	13.50 to 14.00
No. 2 Country Wrought.....	12.00 to 12.50
Wrought Pipe and Flues.....	13.50 to 14.00
Railroad Malleable.....	13.00 to 13.50
No. 1 Steel.....	14.00 to 14.50
No. 1 Machinery Cast.....	16.00 to 16.50
Stove Plate and Light Cast.....	12.50 to 13.00
Cast Borings.....	8.50 to 9.00

Philadelphia.

PHILADELPHIA, PA., March 26, 1907.

Notwithstanding the continued excitement in Wall Street, the Iron and Steel trades appear to be absolutely immune to any adverse influences. The undoubted strength of the Pig Iron market is due to the fact that there are no stocks either in first or second hands, so that there is nothing that can be thrown on the market; neither is it likely that there will be any change in this respect in the next two or three months at least, and perhaps not then. The furnaces are making no better deliveries than they have been doing for the past several months, and the shortage is as great as at any time since last fall. Under such conditions it is, of course, useless to expect sellers to lower their prices until there is some necessity for such action. When that will be it is impossible to say, although there is a general impression that expiring contracts will have to be renewed at somewhat lower figures than have been quoted for some time past. It is probably only a question of time when some such change will go into effect, but there can certainly be no serious decline, because, as already stated, there are no stocks to be unloaded, and it is entirely a matter of opinion how long it will be before the arrears can be made up. From present appearances, it will be several months before this can be accomplished, and how much longer it will be before there is an actual surplus is altogether a matter of uncertainty. For the present everything goes along just as it did before the flurry in Wall Street commenced, and leading concerns in the Iron trade say that they can see no reason why that interest should be affected unless something occurs worse than has been already divulged. From an unprejudiced viewpoint, having regard to all the cross currents, it is probable that the highest crest of the wave has been reached, but it may require a long time before prices can be seriously affected. Makers of Pig Iron see no possible way of increasing their output during the next two or three months, and if they can make their deliveries on contracts already in hand it is the best that they hope to do. The first thing will be to catch up with back orders, and then there may be a period of accumu-

lation, but that is so far in the distance that it hardly need be considered at the present time. Crop influences will doubtless have some influence in the near future, but thus far there is nothing unfavorable that can be reported, and the presumption is that we shall at least have average crops. The decline in Wall Street securities will naturally be felt after a while, but for the present the Iron and Steel trades appear to be fully able to resist all unsatisfactory influences.

Pig Iron.—It is a surprising fact that the demand for Pig Iron shows no falling off whatever. The tonnage changing hands is not large, simply because there is no Iron to deliver except for the last half of the year, for which something quite important has been done, but for the intervening period it is almost impossible to get Iron, which naturally affects the tonnage. The chief interest in the meanwhile is to get deliveries on back contracts, which makers of Pig Iron are anxious to make good, but find that their output is quite inadequate to meet all the requirements. Prices for such deliveries, therefore, cover a very wide range. No. 2 X Foundry, for instance, commands \$24 to \$25, but spot Iron, which can only be had in small quantities, usually brings about \$25.50. Mill Irons are also extremely scarce, but for shipment during the next 60 days there is no difficulty in getting from \$23 to \$23.50, delivered, according to circumstances. Basic Iron is practically dead, as none of the furnaces in this vicinity have anything they can offer, although buyers would doubtless pay \$25 or better for prompt shipment. It will be a surprise to a great many in the trade to learn that this grade of Iron, of a very superior analysis, is offered for shipment from Shanghai, China, although the price named is too high under present conditions. In case the agents could quote \$2 less than they have named business could be worked through, or, if there should be any further advance of the American article, then there might be a possibility of business. The quantity named for shipment to arrive here in June is 2500 tons, with a similar quantity for the third quarter. Low Phosphorus Iron is a little quiet, and would bring about \$26.75 alongside ship, Baltimore, or \$26.50, delivered, to buyers in the seaboard districts. The exact quotations are, of course, difficult to give in the present unsettled condition of the market, but for deliveries in eastern Pennsylvania and adjoining territory they would probably range as follows for the dates named:

Second Quarter 1907.

No. 2 X Foundry.....	\$24.25 to \$24.75
Standard Gray Forge.....	23.00 to 23.50
Basic.....	24.25 to 25.00
Low Phosphorus.....	27.00 to 27.50
Middlesbrough, on dock.....	21.50 to 22.00

Third Quarter 1907.

No. 2 X Foundry.....	\$24.00 to \$24.25
Standard Gray Forge.....	22.50 to 22.75
Basic.....	24.00 to 24.50
Low Phosphorus.....	27.00 to 27.25

Fourth Quarter 1907.

No. 2 X Foundry.....	\$23.25 to \$23.75
Standard Gray Forge.....	22.00 to 22.25
Basic.....	23.50 to 23.75
Low Phosphorus.....	26.75 to 27.00

Ferroalloys.—As we intimated last week, some very important sales have been made of Ferromanganese. The purchasers include all the Steel works within a radius of 100 miles of Philadelphia, the total amount being about 4000 tons all told. Deliveries are to be made during the last half of the year, the average cost being something around \$67, delivered. Holders are now asking more money, and it would be difficult to place an order at less than \$68. Shipments during the second quarter would bring \$70, or better, but of course the keen edge of the demand has been satisfied temporarily.

Steel.—The demand for Steel Billets is somewhat light at the present time, as buyers think that the slump in Wall Street should result in lower prices for Steel and its various products. Meanwhile prices are nominally \$32 to \$33, delivered, for Soft Steel Billets, according to quantity and date of delivery; Forging Steel, \$34 to \$38.

Structural Material.—Business is not specially interesting, although there are quite a number of small orders around, some of which are rather important, but it is not difficult to get prompt deliveries, and the outlook in this department is not quite as favorable as was supposed to be two or three weeks ago, besides being influenced by the very large increase in the productive capacity. Prices remain unchanged, at 1.83½¢ to 2¢, according to specification and delivery, for Beams, Angles and Channels.

Bars.—Steel Bars are practically unobtainable this side of midsummer, and although the nominal price is about 1.73½¢, buyers would be glad to pay the same figure for Iron if they could be sure of getting deliveries during the next two weeks. Refined Iron is fairly steady, at 1.93½¢, and as a rule the mills are working quite full, but there are cases in which lower grades of Iron are offered at concessions from this figure. On the whole, prospects are satisfactory and no great change is expected in the near future.

Plates.—There has been more demand the past week, and involves consumers who are desirous of covering for their

requirements during the entire balance of the year. There is also a fair demand for March and April, besides some urgency for specifications which have already been forwarded. Prices are a little unsettled, but they are not weak by any means, although for a desirable class of business it is not difficult to shade the regular asking prices, which are nominally unchanged from the past several weeks, as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel.....	2.13½	2.18½
Flange or Boiler Steel.....	2.23½	2.28½
Marine.....	2.53½	2.58½
Locomotive Firebox Steel.....	2.63½	2.68½
The above are base prices for ¼-in. and heavier. The following extras apply:		
3-16-in. thick.....		\$0.10
Nos. 7 and 8, B. W. G.....		.15
No. 9, B. W. G.....		.25
Plates over 100 to 110 in.....		.05
Plates over 110 to 115 in.....		.10
Plates over 115 to 120 in.....		.15
Plates over 120 to 125 in.....		.25
Plates over 125 to 130 in.....		.50
Plates over 130 in.....		1.00

Sheets.—A good demand is noted for Sheets, with no change in prices, which are as follows for mill shipments and a tenth additional for small quantities: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 to 26, 3c.; No. 27, 3.10c., and No. 28, 3.20c.

Old Material.—The theory is that Scrap Material ought to be considerably lower, but stocks are in such small compass that it is impossible to make any impression on those who are in position to deliver. Consequently those in urgent need of material have no alternative but to pay full prices, which may be given within the following range, for deliveries in buyers' yards:

Steel Crops and Rails.....	\$19.25 to \$19.50
No. 1 Steel Scrap.....	18.75 to 19.25
Low Phosphorus.....	22.50 to 23.50
Old Steel Axles.....	22.00 to 22.50
Old Iron Axles.....	31.00 to 32.00
Old Iron Rails.....	27.00 to 28.00
Old Car Wheels.....	24.00 to 25.00
Choice No. 1 R. R. Wrought.....	21.50 to 22.00
No. 1 Yard Scrap.....	19.00 to 20.00
Long and Short.....	18.75 to 19.00
Machinery Scrap.....	22.25 to 22.75
Wrought Iron Pipe.....	17.00 to 17.50
No. 1 Forge Fire Scrap.....	17.00 to 17.25
No. 2 Light.....	11.75 to 12.00
Wrought Turnings.....	17.00 to 17.25
Axle Turnings.....	17.00 to 17.25
Stove Plate.....	18.00 to 18.50
Cast Borings.....	18.00 to 18.50
Grate Bars.....	15.75 to 16.25

Pittsburgh.

PARK BUILDING, March 27, 1907.—(By Telegraph.)

Pig Iron.—We can report a slightly better inquiry for Bessemer, Basic and Foundry Iron, but actual sales being made are mostly of small lots for April delivery. Very little Standard Bessemer Iron is to be had for shipment prior to July 1, as it has been pretty well cleaned up by the purchases of the United States Steel Corporation and the Cambria Steel Company. We note a sale of 1000 tons of Malleable Bessemer for March and April delivery, at \$22.50, Valley furnace; 1000 tons of Standard Bessemer for April and May at \$22.25; 1000 tons of Standard Bessemer for spot shipment at the reported price of \$23, and 2000 tons of Basic for April and May at \$22. All the above sales are f.o.b., Valley furnace. We quote Bessemer and Basic Iron for second quarter delivery at \$22, Valley furnace, while Standard Bessemer Iron for spot shipment is bringing slightly higher prices. There is some inquiry for Foundry Iron, but mostly for small lots, and we quote Northern No. 2 for prompt delivery at \$24 to \$24.50, and for second quarter delivery at \$23 to \$23.50, Valley furnace. Prices on Forge Iron seem to be slightly easier, and we quote Northern brands at \$20.75, Valley furnace, or \$21.60, Pittsburgh. On a firm offer it is probable that Northern Forge could be bought at \$20.50, Valley furnace, or \$21.35, Pittsburgh.

Steel.—The supply of Steel in the forms of Billets and Sheet and Tin Bars seems to be getting tighter, and a number of Plate, Sheet and Tin Plate mills and also some of the Wire mills are suffering for lack of Steel. The Carnegie Steel Company is not selling in the open market, and the two Youngstown mills and the Wheeling interest are understood to be sold up to July 1. We quote 4 x 4 in. Bessemer Billets at \$29 to \$29.50 and Open Hearth about \$31.50, Pittsburgh. Sheet and Tin Bars in random lengths are held at \$30 to \$30.50, Pittsburgh or Youngstown mill.

(By Mail.)

Events of the past week have not been of a character to stimulate confidence in the future of the Steel trade. While the effect of these events is not being strongly felt up to this time, yet there is no doubt that if the railroads continue to make public announcement of retrenchment in the matter of expenditures, and if the stock market in Wall

Street does not soon show improvement, these conditions are bound to affect seriously general business conditions. The amount of tonnage on the books of the mills and furnaces was never before as large as it is at present, but much of this tonnage is in contracts on which buyers can postpone specifications or perhaps cancel if they feel that conditions and outlook do not warrant them in carrying them out. There is enough tonnage booked in Pig Iron and Steel and nearly all kinds of Finished Material to insure full work up to July 1 at least, and confidence is strong that present active conditions will be maintained until that time. For the second half of the year there has been but little Pig Iron sold, nor is it likely that many contracts will be placed until the future is more clearly defined. The one serious drawback at present is the tightness in the money market, which is compelling railroads to pay a high rate of interest to get funds, and in some cases even this has not brought forth the money needed by the railroads to make the improvements and additions to rolling stock that they had outlined. The policy of the National Administration is being criticised as largely responsible for the present attitude of the railroads in publicly declaring their intention to shut off contemplated improvements which would have cost millions of dollars. There has been a slight noticeable falling off in new business on certain lines of Finished Iron and Steel, and in a few cases some contracts have been cancelled, but at the same time the fact remains that general business conditions are sound, and there does not seem to be any good reason why we should not have active business for some time to come, more particularly if the country is favored with average crops this year. If we have good crops it will mean that the railroads will again be taxed to their utmost to move them and will be compelled to carry out, to some extent at least, the large improvements originally outlined. There is no doubt that a feeling exists among the railroads that they are being discriminated against by legislatures in nearly every State, and the announcement by the managers of their intention to restrict expenditures is the direct result of this unfriendly attitude.

During the week there have been moderate sales of Bessemer Pig Iron for March and April shipment, at prices as high as \$23, Valley furnace, and of Basic at \$22, Valley furnace. The supply of Basic is better now than of Bessemer, the latter being scarce for delivery in the next two or three months, due to the purchases by the United States Steel Corporation and Cambria Steel Company. The situation in Bessemer Iron as regards supply is as tight as it has been at any time, but there is less trouble in getting deliveries of Basic, Foundry and Forge. The scarcity of Steel is also acute, and a number of concerns are actually in distress for lack of Steel. One leading Plate concern in this city is doing very little, being unable to get Steel to operate. New business in Finished Material is holding up quite well, but the tonnage booked this month shows a falling off as compared with February. The mills rolling Structural Steel, Plates, Iron and Steel Bars, Sheets, Tin Plate and Pipe are well fixed up to July 1 or longer, and will be able to operate in full for the next two or three months, unless there is a loss of confidence, which would cause buyers to cancel contracts placed with the mills some time ago.

Ferromanganese.—We note a fair inquiry, foreign 80 per cent. for prompt shipment being quoted at about \$75, Pittsburgh, while for forward delivery it is held at about \$68, Baltimore, or \$69.92, Pittsburgh.

Muck Bar.—The mills rolling Muck Bar that were put out of commission by the recent flood have again started up, but the tonnage taken out of the market by the shutdown has increased the shortage in supply, and best grades of Muck Bar made from all Pig Iron are held firmly at \$37 to \$37.50, Pittsburgh. Muck Bar made from part Scrap is quoted at \$33 to \$34, Pittsburgh.

Rods.—We continue to note a great scarcity in Rods for prompt shipment, and we quote Bessemer Rods nominally at \$37 and Open Hearth at \$38, Pittsburgh. Any mills rolling Rods that are in position to make prompt deliveries could no doubt get higher prices than are quoted above.

Skelp.—None of the Skelp mills is in position to take contracts for prompt delivery, being filled up for the next two or three months, and prices are very firm and likely to be higher. We quote: Grooved Steel Skelp, 1.90c. to 1.95c.; Sheared Steel Skelp, 2c. to 2.05c.; Grooved Iron Skelp, 2.15c.; Sheared Iron Skelp, 2.25c., all f.o.b. Pittsburgh.

Steel Rails.—New tonnage being placed in Steam Rails is mostly by the traction lines, which are giving out some fair sized contracts. The Carnegie Steel Company took about 12,000 tons of Standard Sections and about 1000 tons of Light Rails in the past week. We quote Light Rails as follows: \$33 to \$34 for 20 to 45 lb.; \$34 to \$35 for 16-lb., and \$35 to \$36 for 12-lb., at mill. Angle Splice Bars are held at 1.65c., and Standard Section Rails at \$28, at mill.

Structural Material.—Contracts being placed are mostly for small lots, but a good deal of large work is in sight. The Michigan Central will likely place this week about 3500 tons of bridge work, while two other Western

roads are also in the market for a large tonnage of similar work. The Baltimore & Ohio will probably build a bridge across the Susquehanna River, while figuring is being done on a large office building in Cincinnati and one or two in St. Louis. Contracts will be placed this week for a theatre in St. Louis, to take about 2000 tons. Deliveries by the mills on Structural Steel are fairly prompt, but on Universal Plates and Steel Bars are very much delayed, especially on the latter. We quote: Beams and Channels, up to 15-in., 1.70c.; over 15-in., 1.80c.; Angles, 3 x 2 x 1/4 in. thick up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x 3 1/2 in., 1.80c.; Zees, 3-in. and larger, 1.70c.; Tees, 3-in. and larger, 1.75c. Under the Steel Bar card, Angles, Channels and Tees under 3-in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Plates.—There is no let-up in the demand for Plates, new tonnage in which is very heavy, one local mill having turned down 5000 tons of Plates recently on which it could not make the deliveries wanted. The Carnegie Steel Company has started its new 72-in. mill at the Homestead Steel Works, and which will make about 5000 tons per month. Premiums of \$2 to \$4 a ton are being paid for Plates for prompt shipment. For forward delivery we quote: Tank Plate, 1/4-in. thick, 6 1/4 in. up to 100 in. wide, 1.70c. to 1.80c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than 1/4-in. to and including 3-16-in.	
Plates on thin edges	\$.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Roller and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell Grade of Steel is abandoned.	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within 10 days from date thereof, discount of 1/4 of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

Sheets.—The new demand for both Black and Galvanized Sheets continues heavy, and deliveries are back still further, owing to the recent flood, which put a number of leading mills out of commission for about a week. There is much complaint from Sheet manufacturers on account of the trouble in getting Sheet Bars, which continue very scarce. Prices are firm, and we quote: Blue Annealed Sheets, No. 10 gauge and heavier, 1.85c.; Nos. 11 and 12, 1.90c.; Nos. 13 and 14, 1.95c.; Nos. 15 and 16, 2.05c.; Box Annealed, Nos. 17 to 21, 2.35c.; Nos. 22 to 24, 2.40c.; Nos. 25 and 26, 2.45c.; No. 27, 2.50c.; No. 28, 2.60c.; No. 29, 2.75c.; No. 30, 2.85c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.65c.; Nos. 12 and 14, 2.75c.; Nos. 15 and 16, 2.85c.; Nos. 17 to 21, 3c.; Nos. 22 and 24, 3.15c.; Nos. 25 and 26, 3.35c.; No. 27, 3.55c.; No. 28, 3.75c.; No. 29, 4c., and No. 30, 4.25c. We quote No. 28 Gauge Painted Roofing Sheets at \$1.85 per square, and Galvanized Roofing Sheets, No. 28 gauge, \$3.25 per square for 2-in. corrugations. These prices are for carload lots, jobbers charging the usual advances.

Hoops and Bands.—Little new business is being placed, the mills running nearly altogether on specifications on contracts, which are coming in freely, and shipments are heavy. We quote: Steel Hoops, 2c., and Bands for all purposes at 1.60c., base, half extras, as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of \$2 a ton being charged for less than carloads.

Tin Plate.—The recent flood caused very serious damage among Tin Plate mills in the Pittsburgh District, the American Sheet & Tin Plate Company having no less than 11 of its different plants under water and out of commission for four or five days due to the flood. Stocks of Tin Plate in a number of the warehouses were seriously damaged by the water, and will have to be re-treated. The loss of time in operation has put the mills further back in deliveries, the American Sheet & Tin Plate Company previously having been much behind, and the other makers in about the same condition. The statement that the leading interest had made official announcement that its price on Tin Plate for third quarter delivery would be \$3.90 per base box is untrue, but the concern has sold some tonnage of Tin Plate for third quarter delivery at the present price, although it has not committed itself to this price for any future delivery. We are advised that some sales of Tin Plate for third quarter delivery have been made at premiums of 5c. to 10c. per box over present prices. We quote: \$3.90 for 100-lb. Cokes, f.o.b. Pittsburgh, for 14 x 20 100-lb. Cokes, terms 30 days,

less 2 per cent. off for cash in 10 days, on which price a rebate of 5c. a box is allowed for carload and larger lots.

Iron and Steel Bars.—Nothing has been heard in Pittsburgh as yet regarding the committee reported to have been appointed by the implement makers to confer with Pittsburgh mills regarding a concession in prices of Steel Bars on season contracts. It will be recalled that at this time last year, when Steel Bars were 1.50c. base, the implement makers wanted a reduction on season contracts to 1.30c. or \$4 a ton. This was refused, but a concession of 10c. per 100 lb., or \$2 a ton, was made, leading mills agreeing to take certain contracts of the implement makers within a specified period on the basis of 1.40c., Pittsburgh, for Steel Bars. Instead of placing these contracts with the Pittsburgh mills, most of the tonnage was placed with the International Harvester Company, and it would seem that the implement makers have not very good grounds at this time for asking a concession in prices of Steel Bars from the Pittsburgh mills, and which is certain to be refused if it is asked. New business in Steel Bars continues heavy, and the difficulty in getting prompt deliveries is shown by the fact that a recent purchaser who wanted 2000 tons for prompt delivery placed the contract with a Pittsburgh mill on the basis of 1.80c., Pittsburgh, which is an advance of \$4 a ton over the regular price. The three leading Pittsburgh mills in the Steel Bar trade, these being the Republic, Carnegie and Jones & Laughlin, are filled with tonnage for some months ahead and are behind in deliveries. New business in Iron Bars is also heavy, the mills being behind in shipments. Premiums of \$2 a ton and more are being paid for reasonably prompt deliveries. We quote Refined Iron Bars at 1.80c., Pittsburgh, and Steel Bars at 1.60c., base, half extras, f.o.b. Pittsburgh, these prices being for forward delivery.

Railroad Spikes.—The demand for standard sizes is showing a slight falling off, and prices are easier. On the smaller sizes there is a heavy inquiry, and makers are much behind in deliveries. We quote standard sizes at \$2.30 to \$2.35 and the smaller sizes at \$2.50 to \$2.60 per 100 lb., f.o.b. Pittsburgh.

Merchant Steel.—The mills that were shut down by the recent flood are again in operation, but the loss of time has put them still further back in deliveries. We note an active demand for Shafting, and official prices, we are advised, are being maintained. We quote: Smooth Finished Machinery Steel, 1.85c. to 2c., depending on quality; Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c., for ordinary grades, and 10c. and upward for special grades. We quote Cold Rolled Shafting at 50 per cent. off in carloads, and 45 per cent. in less than carloads, delivered in base territory.

Pipes and Tubes.—The demand for Merchant sizes of Pipe continues abnormally heavy and is away beyond anything ever known in the Pipe trade. The National Tube Company has entered a very heavy tonnage of Pipe since it withdrew prices on March 8, and other mills report they are unable to take care of the enormous tonnage that is being offered them. Prices are largely what the mills care to ask, the National Tube Company refusing to quote prices and booking tonnage for shipment not to commence before June. The Youngstown Sheet & Tube Company, under date of March 20, issued a new card of discounts, showing an advance of one point, or \$2 a ton. The extreme discount on Merchant sizes of Iron Pipe is now about 68 per cent. on $\frac{3}{4}$ to 6 in., on which a half point and sometimes a point is allowed to the large trade. The extreme discount on Merchant sizes of Steel Pipe, $\frac{3}{4}$ to 6 in., is now about 74 and 5 per cent. to the large trade. Official discounts on Steel Pipe are as follows:

	Merchant Pipe.		Jobbers, carloads.
	Black.	Galv.	
$\frac{1}{8}$ to $\frac{1}{4}$ in.....	65	49	
$\frac{3}{8}$ in.....	67	53	
$\frac{1}{2}$ in.....	69	57	
$\frac{3}{4}$ to 6 in.....	73	63	
7 to 12 in.....	68	53	
Extra strong, plain ends:			
$\frac{1}{8}$ to $\frac{3}{8}$ in.....	58	46	
$\frac{1}{2}$ to 4 in.....	65	53	
$\frac{3}{4}$ to 8 in.....	61	49	
Double extra strong, plain ends:			
$\frac{1}{2}$ to 8 in.....	54	43	

Official discounts on Iron Pipe, which are shaded one-half point or more to the large trade, are as follows, f.o.b. Pittsburgh:

	Standard Genuine Iron Pipe.	
	Black.	Galv.
$\frac{3}{4}$ to 6 in.....	68	58
$\frac{1}{2}$ in.....	63	51
$\frac{3}{8}$ in.....	61	43
$\frac{1}{8}$ and $\frac{1}{4}$ in.....	59	43
7 to 12 in.....	63	48
Extra Heavy Iron Pipe, Plain Ends.		
$\frac{1}{8}$, $\frac{1}{4}$ and $\frac{3}{8}$ in.....	63	41
$\frac{1}{2}$ to 4 in.....	60	48
$\frac{3}{4}$ to 8 in.....	56	43

Boiler Tubes.—We note a continued heavy demand for Locomotive and Merchant Tubes, and in most cases prices are about what the mills care to ask. In some cases \$2 a ton or more advance is paid over official discounts, which are as follows:

	Boiler Tubes.	
	Iron.	Steel.
1 to $1\frac{1}{4}$ in.....	41	47
$1\frac{1}{4}$ to $2\frac{1}{4}$ in.....	42	59
$2\frac{1}{2}$ in.....	47	61
$2\frac{3}{4}$ to 5 in.....	52	65
6 to 13 in.....	42	59

Iron and Steel Scrap.—There is not much buying, consumers holding off to test the market, which is only fairly strong. Mills that were closed by the flood are again in operation, and it is believed the demand for Scrap will soon show betterment. Dealers quote about as follows: Heavy Steel Scrap, \$18 to \$18.25, for Pittsburgh, Sharon or Steubenville delivery; No. 1 Wrought Iron Scrap, \$19.50; No. 2, \$18; Old Steel Rails, short pieces for Open Hearth purposes, \$18 to \$18.25; Old Steel Rails, rerollers, \$19.75 to \$20; Machine Shop Turnings, \$15.75 to \$16; Bundled Sheet Scrap, \$16.75 to \$17; Tin and Terne Plate Clippings, \$18.50 to \$19 in net tons. Low Phosphorus Melting Steel is \$22; Cast Iron Borings, \$14.50; Old Car Wheels, \$24.50 to \$25; Steel Axles, \$22 to \$22.50; No. 1 Cast Scrap, \$21.50; Grate Bars, \$17; Stove Plate, \$16.50. All above prices are in gross tons, f.o.b. Pittsburgh, unless otherwise noted.

Coke.—There seems to be a surplus in the supply of both Furnace and Foundry Coke, and with plenty of cars consumers have no trouble in getting Coke as fast as needed. In fact, several blast furnaces have recently shut off shipments of Coke until heavy stocks on hand could be worked up. We quote Connellsville Furnace Coke for prompt shipment at \$2.90 a ton at oven and 72-hr. Foundry at \$3.50 to \$4 a ton at oven, depending on grade. A sale of 30,000 tons of Connellsville Furnace Coke for third quarter delivery to a Cleveland furnace interest is reported on the basis of \$2.90 a ton at oven.

Cincinnati.

FIFTH AND MAIN STS., March 27, 1907.—(By Telegraph.)

Pig Iron.—The general depression incident to recent flood conditions throughout the Ohio Valley is rapidly disappearing, and the congestion of Southern Iron south of the river appears to be relieved somewhat. There is, however, but little change in the car situation, and shipments continue to come forward irregularly. The available tonnage at this point for spot delivery is small, yet, perhaps, is sufficient to take care of urgent cases. Inquiry during the past day or two has quieted down considerably, and the general market is devoid of any new developments of special interest. One feature, however, which is, perhaps, more prominent at this time than any other, is the fact that quite a number of consumers are urging furnaces to forward during March a portion of the Iron due them on second quarter contract. This, perhaps, is an index of the situation taken as a whole and shows that the available tonnage for immediate requirements is less than contemplated. For last half delivery \$18.50, Birmingham, continues to be the prevailing quotation, although it is said that several of the Southern producers have added 50c. to this basis and refuse to sell at a less figure. It is safe to say, however, that almost any tonnage within reason can be acquired at the minimum figure, and were some firm offers to be made contemplating large blocks it is extremely problematical just what quotations would come forward to obtain the business. Spot prices continue strong and apparently unchanged, with no sales reported of strictly Birmingham grades under \$23 for No. 2. The situation as regards Northern Iron is unchanged, and prices are strong. A Pipe shop in northern Ohio bought 1000 tons for prompt delivery, said to have been all Northern Iron. This concern is now feeling the market with a view, it is said, to covering for the remainder of the year. There is an inquiry from the center of the State for about 2800 tons, divided equally between Northern and Southern grades, delivery running from June to December, inclusive. Freight rates from the Hanging Rock District to Cincinnati are \$1.15, and from Birmingham \$3. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1.....	\$26.50 to \$27.00
Southern Coke, No. 2.....	26.00 to 26.50
Southern Coke, No. 3.....	25.50 to 26.00
Southern Coke, No. 4.....	25.00 to 25.50
Southern Coke, No. 1 Soft.....	26.50 to 27.00
Southern Coke, No. 2 Soft.....	26.00 to 26.50
Southern Coke, Gray Forge.....	23.00 to 23.50
Southern Coke, Mottled.....	22.00 to 22.50
Ohio Silvery, 8 per cent. Silicon.....	31.15 to 31.65
Lake Superior Coke, No. 1.....	26.65 to 27.15
Lake Superior Coke, No. 2.....	26.15 to 26.65
Lake Superior Coke, No. 3.....	25.65 to 26.15

Car Wheel Irons.

Standard Southern Car Wheel.....	\$29.00 to \$29.50
Lake Superior Car Wheel.....	27.50 to 28.00

Coke.—The market is easy, demand moderate and available supply sufficient for the trade. Prices are about the

same as last week. We quote the best brands of Connellsville and Virginia Foundry from \$3.75 to \$4, f.o.b. ovens.

Finished Iron and Steel.—New business is said to be coming forward slowly, and the market is rather quiet, but prices are firm and unchanged. We quote, f.o.b. Cincinnati, as follows: Iron Bars, carload lots, 1.93c., half extras, and in smaller lots, 2.10c., full extras; Steel Bars, carload lots, 1.73c., half extras, and in smaller lots, 1.95c., full extras; Base Angles, carload lots, 1.83c.; Beams and Channels, carload lots, 1.83c.; Plates, ¼-in. and heavier, carload lots, 1.83c., and in smaller lots, 2c.; Sheets, No. 16, carload lots, 2.15c., and in smaller lots, 2.70c.; No. 14, carload lots, 2.05c., and in smaller lots, 2.60c.; Steel Tire, 1 x ¼ in. or heavier, 1.93c. in carload lots.

Old Material.—General trade is somewhat easier, and the demand is quiet. Prices are said to be about the same as last week. We quote dealers' prices, f.o.b. Cincinnati, as follows:

No. 1 R. R. Wrought, net ton.....	\$18.50 to \$19.00
Cast Borings, net ton.....	10.00 to 10.50
Steel Turnings, net ton.....	12.00 to 13.00
No. 1 Cast Scrap, net ton.....	18.00 to 18.50
Old Iron Axles, net ton.....	26.75 to 27.75
Old Iron Rails, gross ton.....	27.00 to 27.50
Old Steel Rails, long, gross ton.....	19.25 to 20.25
Relaying Rails, 56 lb. and up, gross ton	28.75 to 29.75
Old Car Wheels, gross ton.....	24.00 to 25.00
Low Phosphorus Scrap, gross ton.....	21.25 to 21.75

The Dayton Coal & Iron Company has removed from 707 to 713 First National Bank Building, Cincinnati.

Cleveland.

CLEVELAND, OHIO, March 26, 1907.

Iron Ore.—There were two inquiries in the market the past week, for a total of about 50,000 tons of Old Range Bessemer and Non-Bessemer Ores for 1907 delivery, but as far as could be learned no sales were made, the local shippers having already disposed of about all their expected output. Ore shipments from the docks continue very heavy, the fine weather and the advance in freight rates which goes into effect next month having the effect of increasing the activity along this line. Vessels are preparing their boats for the beginning of navigation, which is expected to open between April 20 and May 1, and it is expected that as soon as the freighters can get through the ice there will be a rush of Ore cargoes from the head of the lakes to Lake Erie ports. If navigation should open a little late it is believed that the Ore will be cleaned up entirely from the docks and that some furnaces will suffer from a scarcity of supply. Reports from the ranges indicate that fully as much Ore has been mined during the winter as in any previous winter, and a large amount is awaiting shipment. Some boat chartering has been done the past week, nearly all the charters being for the smaller vessels. It is believed that all the Ore shippers have now covered with vessel tonnage for the season. The charters were made at the same rates at which the heavy chartering was done last December—75c. from the head of the lakes to Lake Erie ports and 70c. from Marquette and 60c. from Escanaba. A number of boats at upper lake ports have been engaged to bring down first Ore cargoes. Nominal quotations for 1907 deliveries at Lake Erie docks are as follows per gross ton: Old Range Bessemer, \$5; Mesaba Bessemer, \$4.75; Old Range Non-Bessemer, \$4.25; Mesaba Non-Bessemer, \$4; Siliceous Bessemer, \$2.75; Siliceous Non-Bessemer, \$2.50.

Pig Iron.—Northern Foundry Iron for spot shipment seems to be scarcer in this territory at present than it has been at any time during the past three months, and the indications are that the situation will show no improvement for at least the next six weeks. Because of the scarcity of prompt shipment Iron, foreign Iron, which has not been sold here for several weeks, has again entered the local market, and several sales of Middlesbrough Iron have been made in lots of 500 tons and over for quick delivery at \$24.88, Cleveland. Furnaces that had a little spot Iron left have been making sales at \$25 at furnace for No. 2 Foundry. A number of sales at \$23 to \$24, Valley furnace, are reported for the second quarter, and some sales for May and June delivery have been made at \$24 to \$24.50 at furnace. But little Foundry Iron is left for sale for second quarter delivery. The Foundry Iron market for the last half is quiet, with the price firm at \$22, Valley furnace, for No. 2. One interest reports several sales of 200 to 500 ton lots during the week, but outside of these sales there have been no inquiries. Foundrymen who have not yet covered are waiting to see if they cannot get a little lower prices, but there are no indications that the furnacemen will make any concessions. Foundries are still making complaints because of slow deliveries of Iron already contracted for. The Basic Iron market is strong and the supply is scarce, especially for April delivery. A furnaceman who had no Iron of his own to sell tried to buy some Basic for a customer during the week for April delivery, and the lowest price that was offered him was \$22.50 to \$23, at furnace. The consumer refused to buy at that price. There are some in-

quiries for Basic for the second half, and the furnaces are asking at least \$21, at furnace. The Bessemer Iron market is firm at \$22, at furnace, for the second quarter and last half. No inquiries are reported for the second half. The Southern Iron market is strong, and some furnaces that have been selling No. 2 Foundry at \$18.50 for second half delivery are now holding at \$19. Quotations for the last half of 1907, f.o.b. Cleveland, are as follows:

Bessemer	\$21.50 to \$22.00
Northern Foundry, No. 1.....	22.50 to 23.00
Northern Foundry, No. 2.....	22.00 to 22.50
Northern Foundry, No. 3.....	21.50 to 22.00
Southern Foundry, No. 2.....	22.85 to 23.35
Gray Forge.....	21.00 to 21.50

Coke.—The market is quiet, and Furnace Coke for spot shipment is weaker, being offered at \$2.90 to \$3, at oven. Foundry Coke is selling at \$3.80, at oven. There is some demand for spot shipment, but no inquiries for future delivery. Coke deliveries, which were in bad shape a week ago as a result of the flood, are now much better.

Finished Iron and Steel.—The general situation shows no change. The heavy demand for all kinds of Finished Material continues, and deliveries are a little worse than a week ago. The demand for Steel Bars is unusually heavy, and Bars for quick delivery are hard to find even at premium prices. The large number of orders on the books and the delay resulting from the recent floods have caused some Bar and other mills to cease taking orders even for premium business for the present. One mill is selling Steel Bars at 1.85c., Pittsburgh, and promises deliveries on some sizes in from one to five weeks, but the best delivery promised by other mills is from two to three months, and deliveries on future contracts are not promised within four or five months. Some orders for Steel Bars for second half delivery are being booked at 1.60c., Pittsburgh, but the mills are not soliciting contracts. While some of the mills are holding firmly to the Pittsburgh price of 1.80c. for Iron Bars, at least two mills are offering them at 1.75c., and promise fairly good delivery. The demand for Plates continues heavy, and the mills are getting further behind. Some are selling Plates at a premium of from \$4 to \$6 a ton, and promise deliveries in from two to four weeks. Sheet deliveries are growing worse, and shipments are not promised within six months. Specifications continue to come in satisfactorily on Plate and Shape contracts, and good sized specifications have been received from railroads for Shapes during the week. No cancellations of railroad contracts are reported in the local market. A fair amount of new Structural Material is being contracted for, but the mills are in good shape on deliveries, so that very little premium business is being contracted for. Billets are in good demand, Forging Billets are selling at \$36 to \$40, Cleveland, and Re-rolling Billets at \$31 to \$32.50, delivered. There is a heavy local demand for Iron Pipe, and deliveries are not promised within two or three months. Local warehouses are still rushed with orders. Stock prices are unchanged. Steel Bars are selling at 1.95c. to 2c. out of stock, and Iron Bars at 2c. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.30c.; No. 28 One Pass Cold Rolled, 3.05c.; No. 28 Galvanized, 4.15c. The stock price on Boiler Tubes, 2¼ to 5 in., is 64 per cent. discount.

Old Material.—The demand for Cast Scrap continues good and prices are firm. Many inquiries are in the market, but the supply is limited, and some foundrymen refuse to buy at the present prices. Turnings and Borings are still in good demand. With the above exceptions the market is very quiet, and there are practically no inquiries. While prices on Old Material, other than that noted above, are weak, they are no lower, being kept up by the outstanding orders. The Lake Shore & Michigan Southern Railroad has sent out lists to dealers of about 3000 tons of Old Material, for which bids are asked. Lists are expected from other railroads in a few days. A scarcity is noted in Stove Plate. The following are dealers' prices to the trade per gross ton, f.o.b. Cleveland:

Old Steel Rails.....	\$17.50 to \$18.00
Old Iron Rails.....	23.50 to 24.50
Steel Car Axles.....	21.50 to 22.50
Old Car Wheels.....	21.50 to 22.50
Relaying Rails, 50 lb. and over.....	29.00 to 31.00
Relaying Rails, under 50 lb.....	31.00 to 32.50
Heavy Melting Steel.....	17.00 to 17.50
Railroad Malleable.....	17.50 to 18.50
Agricultural Malleable.....	15.00 to 15.50
Light Bundled Sheet Scrap.....	16.00 to 17.00
Bundled Tin Scrap.....	17.00 to 19.00

The following quotations are per net ton, f.o.b. Cleveland:

Old Car Axles.....	\$29.25 to \$29.75
Cast Borings.....	10.50 to 11.00
Iron and Steel Turnings and Drillings.....	13.00 to 13.50
No. 1 Busheling.....	14.50 to 15.00
No. 1 Railroad Wrought.....	17.50 to 18.00
No. 1 Cast.....	18.50 to 19.00
Stove Plate.....	15.00

On April 1 the branch offices of the Jones & Laughlin Steel Company will be removed from the Erie County Savings Bank Building to rooms 1019-1023 White Building, Buffalo, N. Y.

The Coal Trade.

BY FREDERICK E. SAWARD.

With April 1 comes the opening of a new coal year, and the situation changes as to prices and production. The first quarter of 1907 has shown only an even tonnage of anthracite, with an excess tonnage of bituminous, and yet the year will open with very light stocks in any direction. Anthracite, domestic sizes, will get down to the usual spring rates, while the smaller or steam sizes will range higher this year. On soft coal there is to be an increase in freight charges by the initial roads, and the price at the mines will no doubt be higher than a year ago, as there is not the stock available that was then the case—anticipating the suspension which took place.

Situation Stronger Than a Year Ago

Buyers should not overlook the fact that a year ago consumers generally were well supplied with coal they had bought in the expectation of a general and long continued strike. Consequently it seemed as if there was no place to ship the coal that was mined in April and May, and thus, while a large tonnage was turned out and disposed of somehow or other (there is a lot of coal burned up every day), there was at the same time a heavy tonnage pressing on the market, which resulted in much demoralization of prices. That will not be the case this year, for we come into the new season with empty yards and empty coal bins in all directions. There is every indication that the spring and summer months will be a much better season than usual for trade in coal, and there is a probability, too, of considerably better prices being realized than was the case last year or the year before.

The tidewater movement at the lower ports, where soft coal is loaded, is increasing in volume with the improvement in the car supply situation. The rumor that the Pennsylvania Railroad had canceled an order for 5000 cars has been the subject of much comment. While cars are easier now, still recent experiences are fresh in mind, and it was hoped that all railroads would continue to get in cars as rapidly as possible to prevent a repetition next fall of the car famine. The action of the Pennsylvania Railroad would seem to support the idea that it is a lack of adequate trackage, rather than lack of cars, that has been crippling the railroads in rush periods.

The attitude of the big Western producing companies in the making of contracts will be watched with more than ordinary interest as it manifests itself in the near future. Comparing the season just closing with its predecessor, there was a greater uniformity of prices and of supplies, though the ruination of values from excessive stocks that were up to demurrage has not been eradicated. In fact, the market for spot coal during the past week has in a most emphatic manner taught the lesson that too much means not narrower margins but smarting losses. Working for a betterment in prices is a sharp suspension of shipments from mines in all producing fields. There is less demurrage coal on the market than a week ago.

The Bituminous Coal Market.

In New England the demand for bituminous coal continues good, and supplies are inadequate to meet current needs. There is still considerable delay in loading at Norfolk and Newport News. There seems to be one thing or another to interfere with the normal supply. Quite a large fleet of arrivals is noted with bituminous the last few days, but the mills and factories are consuming coal so rapidly that such arrivals will be but a small factor in relieving the urgent need of soft coal in almost all directions.

The situation in soft coal in the New York market is easier for the shipper, on account of the shortage of supply at this time. For the past four or five weeks the car supply on most of the bituminous roads has been very poor. This has been followed during the past week by severe rainstorms all through northern Pennsylvania and southern West Virginia, which have restricted the output of soft coal to such an extent that nobody seems to have coal for sale and everybody is anxious to buy to take care of urgent orders and contracts.

The Pennsylvania Railroad has put in force some new regulations as to holding cars at tidewater points. A principal ruling is embodied in this paragraph:

Tidewater coal or coke may change ownership after reaching South Amboy, Harsimus Cove, Greenwich or Baltimore only upon the written order of the original consignee or his accredited representative. All orders for the delivery of tidewater coal or coke to a new consignee or purchaser shall specify the date on which the order is to become effective. The date on which an order for the delivery of coal or coke to the new consignee or purchaser becomes effective shall be considered the date of release of the car for the account of the original consignee, and time shall be charged to him accordingly. No free time allowance will be made to the new consignee or purchaser for cars of coal or coke which change ownership, but detention shall be reckoned and charged against the new consignee or purchaser from the date the order for the delivery to him becomes effective.

The Anthracite Steam Coal Market.

As to the market for small anthracite, the situation may be summed up thus: Small sizes are still in great demand, at premiums varying from 10 to 30 cents per ton over the circular. Pea coal seems very short, and moves promptly at prices from \$3.05 to \$3.15 f.o.b. Buckwheat is perhaps shorter than anything else. This size is almost unobtainable in better grades, and many inquiries are received by all shippers daily in regard to this size. No. 2 buckwheat, or rice, is somewhat easier than it has been, and the price is showing an inclination to drop off slowly. Barley is held at about circular prices. The demand for this size does not seem to be as strong as for other steam coals. Sellers, however, are inclined to hold their coal, awaiting the advance which takes place April 1; but there is doubt in the minds of some as to whether or not this will command the circular price set by many of the companies.

Anthracite operators have agreed to make the usual 50-cent reduction in the price of prepared coal on April 1, when the new spring schedule will go into effect. Whether there will be any decrease in the price of pea coal is a matter of conjecture, since the operators say that there is such a demand for this product, even at this season, that they have, in a large measure, been unable to meet the requirements of consumers. If there is a reduction, it will not be more than 25 cents, they assert. Present prices of free burning coal at New York ports are, per gross ton:

Broken	\$4.50 to \$4.75
Egg	4.95 to 5.00
Stove	4.95 to 5.00
Chestnut	4.95 to 5.00
Pea	3.05 to 3.15
Buckwheat	2.70 to 2.85
Rice, or No. 2 Buckwheat.....	1.75 to 1.85

Individual and washery pea is \$3.05 to \$3.15; washery buckwheat, \$2.65 to \$2.85; washery rice, \$1.75 to \$1.85; barley, \$1.40 to \$1.45. Free burning prices are for coal from companies; individuals and middlemen may charge 10 cents or more additional.

Bituminous at New York loading points may be quoted as follows, per gross ton:

Georges Creek.....	\$3.25 to \$3.35
High grade three-quarter lump.....	3.25 to 3.35
High grade gas, run of mine.....	3.15 to 3.25
Best Miller vein coals.....	2.85 to 3.00
Good Miller and Moshannon.....	2.80 to 2.90
Best Somerset.....	3.00 to 3.10
Fairmont, three-quarter.....	2.90 to 3.10
Fairmont, run of mine.....	2.90 to 3.00
Odds and ends.....	2.70 to 2.75

Bituminous at the mines is about as below, in net tons:

	Prompt delivery.	Contract.
Georges Creek.....	\$1.90 to \$2.00	\$1.60 to \$1.70
Best Somerset.....	1.50 to 1.60	1.40 to 1.50
Somerset	1.30 to 1.35	1.20 to 1.25
West Virginia Freeport.....	1.25 to 1.30	1.00 to 1.15
Fairmont District, three-quarter lump.....	1.20 to 1.30	1.20 to 1.25
Fairmont District, run of mine	1.10 to 1.20	1.10 to 1.20
Fairmont District, slack..	1.00 to 1.10	.85 to .90

An interesting report, just issued, shows the rail and water tonnage in tons of 2000 lb. of bituminous coal for the 12 months ended December 31, 1906, as follows:

Route.	Tons, 1905.	Tons, 1906.
Pennsylvania Railroad.....	46,329,562	49,426,018
Baltimore & Ohio Railroad.....	28,276,145	31,905,599
Norfolk & Western Railway.....	12,613,375	13,558,563
Chesapeake & Ohio Railway.....	8,029,132	10,420,740
Southern Railway.....	3,294,629	3,369,807
Broad Top.....	1,802,441	1,938,257
Monongahela River.....	9,476,280	9,725,729
Soo Canal.....	5,524,355	7,728,255
Davis Island Dam.....	3,926,319	2,883,965
Kanawha River.....	1,427,880	1,116,410
Louisville Falls.....	1,592,487	1,154,991
Chesapeake & Ohio Canal....	177,352	199,237
Kentucky River.....	67,135	73,307

A comparative summary of the shipments of coal by water from five Atlantic ports—New York, Philadelphia, Baltimore, Newport News and Norfolk—during January, shows 1,626,908 gross tons of anthracite in 1907, against 1,321,061 tons in 1906, and 1,943,302 gross tons of bituminous in 1907, against 1,938,592 tons in 1906.

The Delaware & Lackawanna Steel Company, 74 Broadway, New York, expects to place its plant at Oxford, N. J., in operation within a short time. The company intends to install several plants throughout the country, and it has been looking at a location in Washington, D. C., for its second plant, but it has not yet been definitely decided whether this plant will be built in Washington or near New York. The company uses the Wills small converter for the manufacture of Bessemer steel castings. E. Cooper Wills is president; Haverley B. Swart, vice-president, and John Henry Hurlbutt, secretary and treasurer.

New York.

NEW YORK, March 27, 1907.

Pig Iron.—The purchases by the Singer Mfg. Company referred to last week as having amounted to 3000 tons have been considerably larger. They included Virginia, Lehigh Valley and Central Pennsylvania Irons. It is understood that the 11,700 tons required for the Schenectady works of the General Electric Company have been placed, but that the 4500 tons for the Lynn works have not yet been closed. The American Brake Shoe Company which inquired for about 9000 tons has practically withdrawn its inquiry. There is less inquiry for spot Iron, and the market is easier. We quote for spot Northern Iron \$25.50 to \$26 for No. 1 Foundry, and \$24.25 to \$24.75 for No. 2 Foundry. For the second quarter we quote \$25 to \$25.50 for No. 1 Foundry, \$23.50 to \$24 for No. 2 Foundry and \$23 to \$23.50 for No. 2 Plain, at tidewater.

Steel Rails.—Trolley line buying accounts for nearly all of the business reported in the past week. The leading producer sold 6000 tons to the American Electric Company in Idaho, 2000 tons to the Oakland Transit Consolidated Company in California, and 1700 tons to the Augusta, Oakland & Waterville Street Railway in Maine. Bearing on the existing speculation concerning railroad work is the statement that the New Haven Road will use more Rails this year than it has bought. It is authoritatively stated that the New York Central has work provided for, all of which will be carried out, requiring all the Rails it has placed for 1907.

Structural Material.—The supply of work continues heavy, and while here and there complaint is made by fabricating companies that competition has brought what are characterized as needlessly low prices on some recent contracts, the amount of business coming up to be figured on promises enough to go round for some months. The New Haven Road, after considerable lettings a few weeks ago, placed 800 tons more of bridges for its Harlem changes, looking toward the removal of its depot site in the next few years. Now that the desired franchises have been obtained from New York City, the Hell Gate bridge, with viaduct over Ward's and Randall's islands, to connect the New Haven Road with the Pennsylvania terminals on Long Island, and by way of the East River tunnel with the Pennsylvania depot at Thirty-third street and Seventh avenue, is expected to be in shape for bids in the not distant future. It would probably require 15,000 tons of Steel and upwards. An important Salt Lake City programme of building has been begun in the past week in the letting to the American Bridge Company of 3000 tons of Steel for the Newhouse and Boston office buildings, 11 stories each. Samuel Newhouse, who will put up both these buildings, has acquired land on which a hotel, department store and stock exchange building are likely to go up, with other buildings, making a total of 15,000 to 20,000 tons of Steel. The American Bridge Company has taken the contract for 1800 tons for an Oakland, Cal., building, and in New York City the Frankel Building, 2000 tons has been placed. It is estimated that work pending in the West, particularly in Chicago, and on the Pacific Coast, amounts to 50,000 tons. The coaling station for the Virginia Railway, at Sewall's Point, Va., was awarded last week. About 4000 tons of Steel will be needed. The Central Railroad of New Jersey let 1100 tons of bridge contracts to the McClintic-Marshall Construction Company. For a railroad in Peru a considerable tonnage of bridge work is being bid on, deliveries to be made at Lima. For coaling station work and bridge work in the Philippines bids are being submitted to J. G. White & Co., New York. Deliveries from mills are easier. We quote for tidewater delivery on shipments from mill as follows: Beams, Channels, Angles and Zees, 1.84½c. to 1.89½c.; Tees, 1.89½c. to 1.94½c.; Bulb Angles and Deck Beams, 1.90½c. to 1.95½c. On Beams 18 to 24 in. and Angles over 6 in. the extra is 0.10c. Sales are made out of stock of material cut to length at 2¼c. to 2½c.

Bars.—Prices are not so strong as they were, and good brands of Best Refined Bar Iron may now be quoted at 1.84½c. to 1.89½c., tidewater. Some mills are reported to be anxious for business, and offer to make deliveries which seem unusually prompt in view of conditions which have been quite recently prevailing. The inquiry is nevertheless very good, and a considerable volume of business is being transacted. Steel Bars are in fair demand also, and are quoted at 1.84½c. to 1.89½c., tidewater, according to quantity, time of delivery, &c.

Plates.—The demand is confined to small lots. The range of quotations at tidewater is as follows, the inside figures being named by Western mills for delivery far in the future: Sheared Tank Plates, 1.84½c. to 2.14½c.; Flange Plates, 1.94½c. to 2.24½c.; Marine, Plates, 2.24½c. to 2.44½c.; Firebox Plates, 2.75c. to 3.50c., according to specifications.

Cast Iron Pipe.—The market is firm, but inclined to be dull. The largest reported transaction of the week was the letting of 1250 tons by the city of Reading to a foundry located in the city. Small lots are being bought and some

inquiry is current, but nothing large is in sight at present, as far as known. The purchasing by municipalities is expected to develop steadily as spring opens, but the possibility is now noted that private corporations may be influenced to some extent by the heavy decline in securities and the accompanying difficulty of financing any new or additional undertakings. Carload lots of 6-in. are held at \$35.50 to \$36 per net ton at tidewater.

Old Material.—Everything in the line of Cast Scrap continues scarce and in good demand, with prices well maintained. Other specialties which are notably firm, and of which fair sales have been made, are Heavy Melting Steel Scrap, Cast Borings, Heavy Steel Turnings and the cheaper grades of stock used by rolling mills. Deliveries of all these are urgently called for by consumers having contracts, showing that their stocks are low, and hence imparting considerable confidence to dealers that accumulations are not likely for some time. Sales of Heavy Melting Steel Scrap aggregating about 5000 tons have been made to local mills at as good if not higher prices than those paid by eastern Pennsylvania consumers. No. 1 Railroad Wrought and No. 1 Yard Wrought are comparatively neglected, as rolling mills are making so little profit on their present output that they claim to find it necessary to use material which does not cost quite so much. These, however, are the only classes of Scrap really easy. So far as the general market is concerned the reports would indicate that it is in good condition, and the current consumption is taking the accumulations as rapidly as offered. With regard to the future some apprehension is expressed, due to the great decline which has taken place in the price of stocks and other securities. Quotations per gross ton, f.o.b. New York, are as follows:

Old Girder and T-Rails for Melting.....	\$16.25 to \$16.75
Heavy Melting Steel Scrap.....	16.25 to 16.75
Old Steel Rails, rerolling lengths.....	18.50 to 19.50
Relaying Rails.....	27.00 to 28.00
Old Iron Rails.....	23.50 to 24.00
Standard Hammered Iron Car Axles....	28.50 to 29.00
Old Steel Car Axles.....	20.50 to 21.00
No. 1 Railroad Wrought.....	19.50 to 20.00
Iron Track Scrap.....	18.00 to 18.50
No. 1 Yard Wrought, long.....	18.00 to 18.50
No. 1 Yard Wrought, short.....	17.50 to 18.00
Wrought Pipe.....	14.50 to 15.00
Light Iron.....	11.00 to 11.50
Cast Borings.....	12.50 to 13.00
Wrought Turnings.....	14.50 to 15.00
Old Car Wheels.....	22.00 to 22.50
No. 1 Heavy Cast, broken up.....	19.00 to 20.00
Stove Plate.....	16.00 to 16.50
Grate Bars.....	14.00 to 14.50
Malleable Cast.....	19.50 to 20.00

Metal Market.

NEW YORK, March 27, 1907.

Pig Tin.—Another sharp decline was witnessed in the Tin market this week, quotations for spot in London dropping to the low figure for the year of £180 10s. on March 26. This was believed to be partially the result of the strained financial condition as on the following day it reached and closes to-day at £184 10s. for spot and £182 for futures. The Banca sale also had much to do with the lower prices, as it is a general custom to depress the London market as much as possible so as to influence this sale. This auction went at a high figure of 110¼ florins, equivalent to 40.30c., c.i.f. New York. There has been considerable manipulation in the Banca market recently, and enormous quantities of this Tin have been coming to the United States for the leading consuming interest. Banca Tin has not been used to any great extent in the manufacture of Tin Plates heretofore in this country, but is largely used in Europe. The reason assigned for these shipments is that a large London operator in order to cover his requirements in Straits Tin traded Banca for it to this American interest. A feature of the last report of the United States Steel Corporation is that its stock of metals, including Pig Tin, Spelter and Lead, was inventoried December 31, 1906, at \$5,958,744, compared with \$2,558,568 at the end of the year previous. Consumers are taking more interest in the market, but continue to confine their buying to nearby requirements. Consumption is apparently decreasing, and this with the increase of Straits shipments makes the statistical outlook seem poor. The arrivals this month are large, amounting to 4545 tons, and there were afloat for American ports 2025 tons. On Monday and Tuesday of this week there was fair trade, and Tin sold at 39.95c. and 39.80c., respectively. The price to-day is higher at 40.35c.

Copper.—Prices are easier, but there has been little or no business transacted at the lower quotations. Buyers are not disposed to enter the market until conditions are more settled here and in Europe, as no one relishes the idea of going into the market when prices are apt to tumble £6 per ton in London, as they did between Monday's closing and Tuesday's opening. In some quarters, it is said, the London operators are making desperate attempts to break the market, so that they can buy back cheaper, as there is need of much Copper in Europe. Others hold to the view that the

top has already been reached, and point out that railroad facilities are so much improved that Copper can be shipped from the producing regions rapidly. There is also a belief that business is falling off, but none of the large consumers of Copper expects to see the price decline much during the next two months. Sellers of retail lots of Copper adhere to the old quotations of 26½c. for Lake and 26c. for Electrolytic. For large lots the following prices could be obtained, but in the absence of actual business the market is more or less nominal: Lake, 25.25c. to 25.62½c.; Electrolytic, 25.12½c. to 25.37½c., and Casting Grades at 24.62½c. to 24.87½c. It is reported that some arsenical brands could be had at lower figures. The continued decline in the London market was unlooked for, the advices late Wednesday afternoon being that the market had declined further, closing at £98 15s. for spot, and £101 for futures. The price of Best Selected has also declined considerably, to-day's closing price of £107 being £11 under the high price of two weeks ago.

Pig Lead.—Lead is less difficult to obtain, and the price is lower, sales having been made in New York at 6.25c., and it is believed that a firm offer of less would attract business for forward deliveries. In St. Louis lower prices also prevail, Lead having been sold there at 6.05c. The American Smelting & Refining Company continues to accept orders only on the basis of the price current on date of shipment.

Spelter.—The high premiums which spot has commanded for several weeks have disappeared in a small measure. The St. Louis price has declined to 6.65c., although earlier in the week sales were made on the basis of 6.70c. In New York shipments from the West can be had at 6.85c.

Antimony.—The market is still very much unsettled, and consumers do not wish to make purchases even at the prevailing prices. Cookson's is held at 25c., Hallett's at 23c. and other brands at 22c. to 23c.

Ferroalloys.—The scarcity of Ferrosilicon is more marked than at any time this year; quotations for forward delivery are largely nominal at \$110 to \$112 for 50 per cent., and \$150 to \$160 for 75 per cent. The situation in Ferromanganese is very perplexing; most importers could take orders for large tonnages, but there is a dearth of buyers. It is reported that sales for forward delivery have been made as low as \$66, Baltimore.

Tin Plates.—General trade is quiet, but some large orders have been taken for the canning interests. Prices are unchanged, at \$4.09, f.o.b. New York, and \$3.90, f.o.b. Pittsburgh, for 14 x 20 100-lb. Coke Plates. The foreign market is slightly easier, at 14s. 9d.

Old Metals.—Dealers' selling prices of Old Metals have not been influenced as yet by the lower prices for raw materials and are unchanged, as follows:

	Cents.
Copper, Heavy Cut and Crucible.....	23.75 to 24.75
Copper, Heavy and Wire.....	23.00 to 24.00
Copper, Light and Bottoms.....	21.50 to 22.50
Brass, Heavy.....	18.75 to 17.50
Brass, Light.....	13.75 to 14.50
Heavy Machine Composition.....	21.75 to 22.50
Clean Brass Turnings.....	15.25 to 16.00
Composition Turnings.....	18.25 to 19.00
Lead, Heavy.....	6.00
Tea Lead.....	5.70
Zinc Scrap.....	5.00

Iron and Industrial Stocks.

NEW YORK, March 27, 1907.

It had been hoped that any further recession in prices of stocks would be of an orderly character, not involving any serious disturbance. This, however, has proved to be a false hope. Following a few days of comparative firmness, Friday of last week developed a rapidly declining tendency, and this caused severe breaks in American securities on the Berlin and London exchanges on Saturday morning, accompanied by reports of an actual panic in Berlin. The New York Stock Exchange then became the scene of a much more serious decline than that of March 14. The situation continued in a semipanic nature on Monday, notwithstanding reassuring advices from Europe as to the conditions there. No change for the better occurred on Monday afternoon, and even on Tuesday morning very low prices were made, but on Tuesday afternoon some recovery took place, assisted by the release of Government funds to local banks. The most surprising feature of the serious fall in security values is that thus far no failures are reported of financial institutions or even of speculative houses. The decline in prices which occurred during this last period of falling values is shown by the following quotations, which give the high price on Thursday and the lowest price touched during the days following, whether on Saturday, Monday or Tuesday: United States Steel common 37½ and 31½, preferred 100% and 91½; Car & Foundry common 37½ and 31, preferred 98 and 92½; Locomotive common 65 and 55½, preferred 106 and 101; Steel Foundries preferred 38½ and 35; Cambria Steel 37½ and 33½; Colorado Fuel 35½ and 29; Pressed Steel common 36½ and 30, preferred 92 and 86; Railway Spring

common 45¼ and 39; Republic common 27 and 22½, preferred 85 and 78; Sloss-Sheffield common 54 and 46; Tennessee Coal 142 and 130; Cast Iron Pipe common 37¼ and 30¼, preferred 80 and 75; Can preferred 52 and 48¼. Prices were well sustained this morning, and last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 33½, preferred 96½; Car & Foundry common 34, preferred 97; Locomotive common 60, preferred 102½; Steel Foundries common 7½, preferred 35; Colorado Fuel 32½; Pressed Steel common 34, preferred 89½; Railway Spring common 42; Republic common 24¼, preferred 84; Sloss-Sheffield common 52½; Tennessee Coal 137; Cast Iron Pipe common 33½, preferred 75; Can common 5¾, preferred 51.

Stockholders of the Jeffrey Mfg. Company, Columbus, Ohio, recently subscribed to \$300,000 of 6 per cent. cumulative preferred stock at par. The authorized stock is \$6,000,000, of which \$3,000,000 is preferred, subject to redemption after July 1, 1910, at 115 at the discretion of the directors; issued \$1,200,000 common and \$400,000 preferred. From the proceeds of the latter a bond issue of \$100,000 has been retired. The balance sheet of May 16, 1906, is as follows:

Cash	\$10,126
Stock, machinery, tools and fixtures.....	2,050,455
Real estate.....	109,947
Stocks and bonds, at par.....	90,631
Patents	171,541
Bills and accounts receivable.....	395,406

Total.....\$3,334,106

Capital stock.....	\$1,200,000
Surplus	1,000,000
Profit and loss account.....	593,321
Bond account.....	100,000
Bills and accounts payable.....	440,735

Total.....\$3,334,106

Dividends.—The Tennessee Coal, Iron & Railroad Company has declared a quarterly dividend of 1 per cent. on the common stock, and 2 per cent. on the preferred stock, both payable April 10.

The Westinghouse Electric & Mfg. Company has declared a quarterly dividend of 2½ per cent. on the preferred, assenting and nonassenting stocks, payable April 10.

The Westinghouse Machine Company has declared a quarterly dividend of 2½ per cent., payable April 10.

The Westinghouse Air Brake Company has declared a quarterly dividend of 2½ per cent. and an extra dividend of 2½ per cent., both payable April 10.

The New York Air Brake Company has declared a quarterly dividend of 2 per cent. payable April 5.

The E. W. Bliss Company has declared a quarterly dividend of 1¾ per cent. on the preferred stock, payable April 22.

The Rhode Island-Perkins Horse Shoe Company has declared a quarterly dividend of 1¾ per cent. and an extra dividend of ½ per cent. on the preferred stock, payable April 15.

The American Screw Company has declared a quarterly dividend of 2½ per cent. payable March 30.

The Chicago Pneumatic Tool Company has declared the regular quarterly dividend of 1 per cent.

A Large Government Power Plant.—The United States Government, after two years of consideration, has awarded the equipment contracts for the new central power station, which is now in course of construction at Washington. It will be situated about four blocks south of the Capitol in Garfield Park, and will, when completed, furnish heat, light and power for the group of buildings immediately surrounding the Capitol—namely, the Congressional Library, the new Senate and House office buildings and the Capitol itself. The contract, finally approved by the last session of Congress, calls for 16 600-hp. high pressure Atlas water tube boilers and four 2000-kw. Westinghouse-Parsons turbines, which are to be delivered prior to the first of next year, at which time the plant, it is hoped, will be in actual operation. The order for boilers is said to be the largest ever placed by the Government, and the plant, when completed, will be one of the largest of its kind in the United States. J. G. White & Co. are the Government's consulting engineers.

In a recent lecture by Victor Stabl before the Sheffield, England, Society of Engineers and Metallurgists, it was stated, that 18 gas fire crucible steel furnaces are in use in Sheffield. One user reports a saving of £2 per ton of steel by installing a gas plant. The fuel cost for a gas plant varies from 7 to 10 shillings per ton of steel, while in coke heated furnaces for every ton of steel produced there is a consumption of 50 to 60 cwt. of coke at

23 shillings per ton, a total of £2 17s. 6d. to £3 9s., leaving a balance against the coke plant of £2 15s. per ton of steel melted.

Steel Railroad Ties.—It is interesting to note the experience of the Bessemer & Lake Erie Railroad with steel ties laid in the winter of 1904-05. They are of the Carnegie I-beam type, and replaced white oak ties in a section of track on a curve, laid with rails weighing 100 lb. to the yard and ballasted with 6 to 8 in. of slag. One thousand of these ties were put into service and, although the space occupied by a steel tie is much less than that taken up by a wooden tie, no additional ballast was inserted, and as a result the ballast did not half fill the track. For several months the entire traffic of the road passed over these ties, for it was not until June, 1905, that the track was doubled at this point. The chief engineer of the road says that up to last October only one rail had been broken on these ties, and that was found to be due to a flaw in the rail. Where the steel ties have been used there appears to be less wear on the rails, and the wear is more uniform than where wooden ties are used. The ties have not yet been in service long enough to demonstrate their life.

American Automobile Production.—It is stated that the United States produced in 1906 more automobiles than did France, heretofore always the leader. The figures are given as 60,000, compared with 55,000. In 1902 the production of the United States was placed at only 314 machines, as compared with 350 for Italy, 1700 for Belgium, 4738 for Germany, 6253 for England and 23,711 for France, this latter figure being nearly double that of the other countries combined. In 1903 the United States had passed Italy and was close behind Belgium, with 2722 as against 2839. In 1904 Belgium and Germany had been passed, the latter by a scant margin of four (11,374 to 11,370). In 1905 we had passed England (23,877 to 20,848); and now have taken the lead from France. During the last two years Italy has exceeded Belgium in construction; otherwise the rank stands in the order in which the several nations were passed by the United States. In total construction to date, France, of course, holds a large lead, with 227,000 cars. The United States is second, with 98,300, more than half of which were built last year. England has built 87,000; Germany, 67,000; Italy 33,000 and Belgium, 30,500.

The Green Air Heater for Water Gas Making.—In making water gas between 75 and 100 per cent. more coke or anthracite coal is used than theoretically should be required. This is mainly because an immense amount of heat is wasted to the atmosphere during the blowing up period. The Green Fuel Economizer Company, Matteawan, N. Y., has lately installed apparatus in illuminating gas plants for saving some of this wasted heat by preheating the air going into the gas generator and by preheating the boiler feed water. Preheating the air, it has been found, saves at least 15 per cent. of the generator coal and greatly reduces the blowing-up period, and preheating the boiler feed saves about 25 per cent. of the boiler coal, the net result being that the apparatus required will nearly pay for itself during the first year of use. The apparatus in the first case consists of a Green air heater and in the second of a Green economizer. Those interested in the manufacture of water gas will find much of value in a pamphlet recently issued by the Green Company, which gives a technical analysis of the process as ordinarily conducted and data of tests made before and after using the heat saving apparatus.

The metric system has again been rejected in the British House of Commons. On March 22 that body, by 150 to 110 votes, defeated the bill purposing to introduce the metric system into Great Britain. President Lloyd-George of the Board of Trade, in behalf of the Government, said the adoption of the system would be a dangerous and costly experiment, by which Great Britain would lose the advantage which she now possesses in foreign markets over her metric system competitors.

Railroad Building Now in Progress.

The outlook for railroad building in the United States is not as promising as it was one year ago, according to the *Railway Age*, which publishes reports of railroad building now in progress. In March, 1906, the records showed over 13,000 miles of new railroad under contract, nearly one-half of which was completed before the close of the year—a larger mileage than for any year since 1888. To-day the mileage reported under contract or construction is 11,912, and in addition 8766 miles is put under the "live projects" head. While there will be great activity in 1907 in pushing to completion new lines on which the work of construction already is well advanced and financial arrangements for which have been made, the launching of new projects, for which the capital must be provided, in many instances has been postponed until conditions improve.

There is every reason to believe, except for the conditions mentioned, that the mileage of track laid in 1907 might exceed the 6100 miles reported in 1906. A large amount of grading was completed last year in addition to the track laid. The distribution of the work under way and the "live projects," many of which would be undertaken this year were conditions more favorable, is given below:

	Under contract or construction. Miles.	Live projects. Miles.
New England States.....	3	330
Middle Atlantic States.....	296	1,011
South Atlantic States.....	1,821	558
Gulf and Mississippi Valley States.....	1,755	396
Central Northern States.....	1,000	377
Southwestern States.....	2,286	2,070
Northwestern States.....	1,885	963
Pacific States.....	2,866	3,061
Totals.....	11,912	8,766

The above table shows that the Pacific States have a larger mileage (2866 miles) under contract than any other group of States, although there is great activity in the Southwestern States, where 2286 miles are under contract. The State having the greatest mileage under contract (990 miles) is Washington, and over 700 miles of this is being built by the Harriman and the Hill lines and the Chicago, Milwaukee & St. Paul. Some other States which show large mileage under contract are: Texas, 850 miles; Montana, 719 miles; California, 602 miles; Louisiana, 593 miles; Nevada, 568 miles; North Carolina, 480 miles; Virginia, 449 miles; Florida, 400 miles; Wisconsin, 398 miles; South Dakota, 381 miles; Oregon, 353 miles; Minnesota, 323 miles; Arkansas, 300 miles.

Improvements at Homestead.—The new 72-in. plate mill at the Homestead Works of the Carnegie Steel Company, authorized under the schedule of 1906 improvements, was put in successful operation March 18. This mill is of the same size as the Twenty-ninth street plate mill of the Carnegie Company, and is intended to cover the same range of weights and sizes. It will have an annual capacity of about 60,000 tons. The improvements to the 35-in. structural mill at the Homestead Works are well under way and the mill will shortly be put in operation in its new form. It has been furnished with two new compound condensing engines, and a division has been made between the roughing and finishing ends, so as to allow the finishing end to run at a higher rate of speed.

The Aluminum Company of America, Pittsburgh, is installing at its plant at New Kensington, Pa., a continuous sheet mill for rolling aluminum sheets, which is said to be the only one of the kind ever built, and is to have the largest capacity for rolling sheets of any mill in the country. It is being built by the A. Garrison Foundry Company, Pittsburgh. The Aluminum Company of America is also making some additions to its power plant at New Kensington, including one 400-hp. Parker boiler and two 300-hp. Westinghouse gas engines. It has further considerably improved its plants at East St. Louis, Ill., and Niagara Falls, N. Y.

The Machinery Trade.

NEW YORK, March 27, 1907.

The leading question in the trade the past week was the probable effect on business of the slump in the stock market. Thus far it has not materially influenced the demand for machinery, which continues at a high level, but it is the opinion of many that as a result of the heavy fall in prices of stocks some slackening in business will probably be felt. It is thought that such a reaction, if not too great, will be a benefit to the trade in that it will cause business to recede to a more normal condition and thus place manufacturers in a position to make better profits. This is, of course, assuming that the falling off in the demand would not be so serious as to cause depression. With the high prices of material, high cost of labor and extended deliveries, it is said that profits are not what they should be on the amount of business transacted. A prominent member of the trade states that with business at the high pitch that it has been for the past few months the economic point of production is likely to be exceeded; while advanced prices are obtained the producing cost is so excessive, because of the cost of materials and labor, as to cut off much of the normal profits. When wages rise labor is often less efficient. The result of these conditions is shown by the earnings of the railroads. While the roads have been carrying an unprecedented amount of tonnage and gross earnings have materially increased, the net earnings are much smaller in proportion to gross. Again, it is said that there is much more satisfaction in doing business with normal conditions prevailing; the buyer can cover his wants, and the seller can make satisfactory delivery. The machinery trade has had a healthy growth and for a long time business has consisted principally of small lots, placing it on an extremely sound basis. Plants are full for months to come, the great proportion of orders booked being such as will not likely be canceled. A slight lull in business would not be detrimental, as it would give manufacturers a chance to catch up with orders. However, this has not yet appeared in this section, where the demand is still large. Only a few days ago some second-hand lathes were sold by a dealer at \$50 each above the price of new machines of the same make, and five different parties were after them, all willing to pay a higher price than that on the manufacturer's list.

A meeting of representatives of the machinery and metal trades, who are interested in the movement to form a luncheon club, will be held in the rooms of the Board of Trade and Transportation, 203 Broadway, on Thursday, April 4, at 1.30 p.m. The meeting has been called by F. H. Stillman, who originated the movement. Mr. Stillman now has more than 250 favorable replies to the communication he sent to the trade some time ago, asking for opinions regarding the movement to establish the club. Notices are being sent to all those who have been enrolled as favoring the movement, requesting them to attend the meeting, and it is hoped that there will be a large turnout of those interested in the proposed club.

Japan to Make Steel Mill Purchases.

A commission of four Japanese engineers appointed by the Imperial Government to study conditions in the United States, England and Germany, with a view to getting some ideas of spending about \$10,000,000 for improvements to be made to the Government's steel works, spent last week in visiting the Japanese commission houses in New York, and left on Wednesday for Europe. The commission will visit the steel works in England and Germany, and will return to this country and make a tour of American steel mills. The engineers spent considerable of their time in the offices of Takata & Co., 60 Wall street; Mitsui & Co., 445 Broome street, and Okura & Co., 11 Broadway. All of those firms have in the past done a great deal of purchasing here for the Japanese Government, and a representative of one of them in discussing the probability of future business with Japan declared that the engineers favor some classes of steel mill equipment made in this country, and it is confidently expected that a considerable portion of the buying that the commission will report on will be done in this country. The commission of engineers is expected to return to Japan in two months, and will not remain long abroad, as they expect to give a good part of their time to visiting plants here. The chief engineer of the mechanical department of the Imperial Steel Works and the secretary of the Imperial Steel Works are members of the commission. It will be remembered that quite a list of machinery equipment for Japan came into this market several months ago, and while representatives of the exporting houses are not at liberty to state just how orders were placed, it was declared that the bulk of the buying was done in this country. Considerable

of the business was placed in England also, and it is interesting to note that Germany was a rather poor third in the last buying movement of the Imperial Government. Heretofore the Germans have landed the larger part of the Government business, and it is stated that the Japanese engineers have shown a disposition of late to study American methods of manufacture, and have been giving our machinery the preference. This attitude is not confined to the engineers in the Government's employ alone, as inquiries now before the trade indicate, one Japanese firm having a list out covering equipment for a fair sized tin mill to be built by private interests. The appropriation which the Government expects to make for additions to its steel works will not be expended at one time, but it is thought the purchasing may extend over two or three years.

Pennsylvania Railroad's Machinery Requirements.

The Pennsylvania Railroad, through the purchasing department, will issue inquiries during the next few days upon the following list of tools and machinery: One pneumatic double cylinder flue welder, with dies, mandrels and swedging dies for tubes 2, 2½, 3, 3½ and 4 in. in diameter; one flue welding oil furnace for 2 to 4 in. flues; one inside molding machine to work material from ¾ to 5 in. in thickness and up to 10 in. wide, manufacturer to state size of motor required to run machine; one plate roll to handle plates 10 ft. wide, ¾ in. thick, driven by direct current Westinghouse motor, 110-volt direct current; one two-spindle solid die bolt cutter for ½ to ¾ in. bolts, driven by Westinghouse 110-volt direct current motor; one oil furnace for heating rivets; one engine lathe, 27-in. swing, distance between centers 10 ft., taper attachment, driven by Westinghouse 110-volt direct current motor; one engine lathe, 36-in. swing, distance between centers 16 ft., taper attachment, driven by Westinghouse 110-volt direct current motor; one portable hoist, size B; one engine lathe, with a 16-in. swing, distance between centers 4 ft., with taper attachment; one metal planing machine, size 36 x 36 in., length of table 8 ft., two heads on the cross rail and one head on upright, price wanted on machine standing parallel and at right angles to line shaft; two extra heavy double head axle lathes driven by Westinghouse 220-volt direct current motors, also price if driven by Westinghouse 220-volt, two-phase, 60-cycle alternating current motors; one large double arbor cabinet maker's saw bench; one sand belt machine similar to No. 3 machine; one plow handle similar to No. 3 machine; one engine lathe, 27-in. swing, 6 ft. between centers with taper attachment, driven by Westinghouse 220-volt direct current motor; one 6-in. pipe threading machine, driven by 60-cycle, two-phase, 220-volt Westinghouse alternating current motor; one 8-in. pipe threading machine, driven by Westinghouse 60-cycle, two-phase, 220-volt alternating current motor; one 48-in. car wheel boring machine, with hub facing attachment, driven by three-phase, 60-cycle, 220-volt Westinghouse alternating current motor; two 10-ton steam locomotive cranes, with curved jib and steel inclosed cab and M. C. B. couplers, to have four-wheel truck and be self-propelling, price for one or two machines to be given; one setting and filling machine for woodworking circular saws up to 40 in. in diameter; one complete gas engine turntable tractor for 75-ft. turntable; one turntable tractor for 75-ft. turntable, to be equipped with 25-hp. Westinghouse 500-volt direct current motor; one engine lathe, 30-in. swing, 6 ft. between centers with taper attachment.

Plans have been completed for the new shops to be constructed at Jacksonville, Fla., by the Seaboard Air Line, and bids are now being received for the construction of the buildings. The management has gone over the general equipment that will be required for these buildings, and it is likely that inquiries for the machinery will be received in the trade within the next few weeks.

The Baltimore & Ohio and the Chesapeake & Ohio railroads have been doing some buying the past week, the more important being that of the former road, which is making purchases against the good sized list of tools it issued some time ago. This company has also purchased some equipment for the new terminal at Washington, D. C., which is being constructed jointly by the Baltimore & Ohio and Pennsylvania railroads.

The directors of the Erie Railroad, it is announced, have decided to curtail new construction work in New York because of the alleged burdensome laws against railroad operations contained in Governor Hughes' Public Utility bill. The decision on the part of the railroad will have a material effect on the machinery trade in this vicinity, as the company during the past year arranged to do about \$8,000,000 worth of construction work in New York. The law in question provides among other things that no railroad corporation may acquire any part of the capital stock of any other railroad corporation without the authority of a commission created by the bill, and it also provides that no railroad shall purchase or acquire under any circumstances more than 10 per cent. of the capital stock of any other railroad corporation. It has been officially announced by the company that all of the improvements now under way in New York State will be postponed indefinitely, and in this

connection the contractors building the new Erie & Jersey Railroad from Port Jervis to Newburg Junction were ordered last Friday to stop all work and remove all apparatus within 30 days. Other contemplated improvements will, it is said, not be carried out, for the present at least.

The American Car & Foundry Company is now buying equipment for its tank shop, to be built in connection with its plant at Milton, Pa. The machinery is being purchased by Thomas R. Brown, who is the company's inspector of tools and machinery and has an office at Milton. Specifications are out in the trade, among other things, for two 250-kw. generators, for direct connection to either tandem, compound or single engines, of which the company will buy two of about 400 hp. each. The additions to the Milton plant consist principally of a structure 74 x 560 ft.

The American Brakeshoe & Foundry Company, 170 Broadway, New York, is planning to erect a large plant at Chattanooga, Tenn., to take care of its growing Southern business, and to add generally to its manufacturing facilities. The company is one of the largest railroad supply corporations in the United States, and it is understood that the present manufacturing facilities are inadequate for the demand. No machinery equipment has been purchased as yet, it is understood, as those details are not entirely arranged.

There are inquiries in the market from the United States Steel Corporation for conveying equipment, which it is thought is intended for the American Steel & Wire Company's proposed additional wire mill, to be erected at Cleveland, and it is thought that later there will be other requirements for that plant, as the company has enlarged on its original plans, which were announced the first of the year. When the proposed Cleveland plant is completed the bale wire mill, now located at Worcester, Mass., will be moved to Cleveland, and some additions will be made to the rod mills at Worcester, which will also necessitate considerable purchasing. Just how much the company will enlarge its Worcester plant has not been fully decided as yet, but those in the trade who are close to the corporation's movements state that considerable equipment will be required.

Because of the large increase in business the General Electric Company, Schenectady, N. Y., is planning to greatly enlarge its manufacturing facilities by the erection of new buildings and the installation of additional equipment. It will be remembered that the company is planning the erection of a large plant at Erie, Pa., and is also enlarging its other plants. The company has just let contract for enlarging its plant at Fort Wayne, Ind., the new buildings to be erected to include a main structure, 150 x 229 ft., four stories high, and a power plant, 60 x 70 ft.

Julian Kennedy, Pittsburgh, Pa., has been engaged as engineer to build the 300-ton blast furnace at Buffalo, N. Y., for the Wickwire Steel Company, which was lately incorporated by the well-known steel and wire firm of Wickwire Brothers, Cortland, N. Y. Specifications for the machinery requirements have not yet been sent out.

Some little equipment will be purchased by the Globe Malleable Iron Company, Syracuse, N. Y., to equip the new buildings which it is to erect. The company will install tumbling barrels, molding machines, some jib cranes and conveyors for handling coal and sand. The only part of this machinery that has been decided upon is the tumbling barrels, which have been purchased. About \$30,000 is to be spent in doubling the size of the plant, and there will be three one-story buildings erected, of reinforced concrete and steel, 80 x 160, 20 x 180 and 60 x 100 ft., respectively.

The Standard Cast Iron Pipe & Foundry Company is now buying the equipment for its new plant to be erected at Bristol, Pa. A number of orders have been placed in this market, and it is thought that a large part of the business will be closed out here. The company's new plant will consist of 13 buildings, the largest of which will be a machine shop, 83 x 203 ft., and two foundry buildings, one of which will be 101 x 459 ft., and the other 129 x 189 ft.

The Wire & Telephone Company of America is preparing to rebuild its bare wire plant, at Rome, N. Y., which was destroyed by fire a few weeks ago. Bids are now being received on the general contract, which will include two buildings, one to be 50 x 201 ft. and the other 92 x 200 ft. The company will require engines and boilers capable of producing about 300 hp., for which inquiries are out, and the company will probably need some wire drawing equipment.

The New York offices of Hill, Clarke & Co., the S. W. Card Mfg. Company and the L. S. Starrett Company, which have formerly been located at Liberty and Greenwich streets, will be moved about May 1 to 132 Liberty street.

The National Association of Brass Manufacturers will meet at the Hollenden Hotel, Cleveland, Ohio, on Monday and Tuesday, April 8 and 9. On the following day a joint meeting of the brass interests will be held at the request of the Detroit Brass Manufacturers' Association for the purpose of considering matters of general interest to the brass business in all lines.

Philadelphia Machinery Market.

PHILADELPHIA, Pa., March 26, 1907.

Whether prosperity in the machinery trade is to continue uninterruptedly or whether we are approaching a decline are questions that have had a large share of attention on the part of both dealers and manufacturers during the past few weeks. The general financial situation of late has not been considered conducive to continued prosperity, and while this condition may be but a temporary one, its influence is being felt quite extensively.

The recent action of some of the railroads, as well as larger individual corporations, in this territory, to go slowly on new propositions has also had a tendency to depress the market. This, however, we understand, is not meant to be operative on propositions already under way (which will be completed), but merely as a precautionary measure which will be governed by conditions as they may exist later in the year. As far as can be learned there has been no cancellation of orders, and from existing conditions few are expected.

Manufacturers of tools and machinery of practically every class have their order books well filled, and the capacity of their plants is in most cases covered for months ahead. By far the greater proportion of this business is made up of small orders—that is, for single tools or for small and medium sized lots at the most—the purchasers of which, in the larger number of cases, need the tools very badly. Large propositions have been pretty scarce for some time, and cancellations, should they develop, would, it is thought, be pretty well scattered. Until these various conditions adjust themselves it is thought that a continuation of the present indefinite determination on the part of buyers will prevail.

Business the past week has reflected the general conditions. Prospective buyers are inclined to hold off so as to get a clearer perception of what the future has in store before placing orders. In cases where tools are absolutely needed, however, no difficulty is experienced in closing the business. Sales during the week have been confined almost entirely to single tools, and a good proportion of the business done has been in tools which could be delivered promptly, in many cases directly from dealers' stocks.

Deliveries on some lines and sizes of tools have improved slightly, while in other cases manufacturers have been compelled to further extend their delivery dates. Inquiries continue fairly good and cover quite a wide range of tools, but as a rule fail to lead up to business very promptly.

There has been no change in the foreign demand. Here and there some business has been closed, but the amount has not been large. Special tools and equipment find a more ready sale than do the tools of the so-called standard lines. Manufacturers of specialties for power transmission and other purposes who have a more or less established trade abroad report an increased volume of business.

Boilers and engines continue in good demand, especially those of the higher capacities, while for the smaller engines and boilers the demand is not so active. Dealers advise that there is room for considerable improvement in the demand for second-hand boilers.

Second-hand machine tool merchants report a good volume of business, covering all classes of tools. The demand is as strong as ever, and a number of very satisfactory sales have been made recently.

The foundry trades continue extremely busy. Both gray iron and steel casting plants are producing heavy tonnages and in a large number of cases have more business offered than can be well taken care of. Difficulty continues to be experienced in obtaining supplies of raw materials, and delays in delivery are complained of by both machine tool builders and other users of castings.

The Filtration Bureau, Department of Public Works, city of Philadelphia, has refused the bid for connections for the steel pipe line distribution system, for which proposals were recently asked. But one bid was received for this work, and it was decided to readvertise. This will cause but a slight delay in the work on the system.

The Franklin Chemical Works has taken title to two tracts of land, embracing an area of 105 x 135 ft., at Cayuga and Philip streets, adjoining its present plant. This ground was purchased with an ultimate view of enlarging the plant, but nothing definite has been decided in the matter at this time.

It is now understood that the directors of the Philadelphia & Reading Railroad and the Philadelphia, Germantown & Norristown Railroad, a leased line, have ratified the agreement with the city for the elevation of the surface tracks on Ninth street, as well as the Port Richmond branch, in this city. As all the engineering plans have been worked out and agreed upon, it is believed that work may be started by the middle of April. It is estimated that the cost of this work will be about \$11,000,000. Of this amount the cost, it is said, is to be divided as follows: Philadelphia & Reading Railroad, \$5,500,000; city of Phila-

delphia, \$5,100,000; Philadelphia Rapid Transit Company, \$400,000.

The County Commissioners of Delaware County, Pennsylvania, have rejected all the bids for a new steel bridge over Darby Creek at Prospect Park, deeming them excessive. But three bids were received, the lowest, it is understood, being about \$65,000. The commissioners have asked for revised bids, which are to be opened at an early date.

Dienelt & Eisenhardt, Incorporated, note a particularly good demand for dead stroke hammers, both for general forging work and for coppersmithing purposes, and a number of satisfactory orders have been booked. The demand for hydraulic jacks is not quite so good and has been confined largely to those of the medium sizes. Orders are in hand for several large oil cloth printing machines, and all departments of the plant continue fully occupied, the foundry particularly so. Deliveries recently have been above the average, and include shipments to customers in all sections of the country.

The E. H. Mumford Company, manufacturer of foundry molding machines, has taken, in addition to the sole agency for the Pridmore rockover molding machines for eastern Pennsylvania, Maryland, Delaware and part of New Jersey, the sole representation for the complete line of molding machines made by Henry E. Pridmore, Chicago, Ill., for the same territory. Business is reported in very satisfactory condition by the Mumford Company, and both inquiries and sales have been numerous. Plain power ramming machines and small split pattern machines appear to be in the greatest demand. Power ramming machines have been sold for export to Canada, while Rathbone multiple molding machines have been ordered by a number of different concerns. This company has recently completed arrangements for additional floor space for manufacturing purposes, and will be able to make extensive shipments more promptly in the near future.

The Energy Elevator Company notes the continuation of a large number of inquiries for elevators, but finds that they do not lead up to business quite as promptly as heretofore. The demand recently has been confined largely to hand power elevators of the standard type, orders for which have been taken from various sections of the country. Several orders for electric power elevators have been booked, one of which is to be installed in the warehouse of the De Witt Wire Cloth Company in this city. A heavy carriage lift has been supplied to parties in Tarrytown, N. Y., while deliveries of freight elevators have been made to customers in the New England, Middle and Southern States.

Chicago Machinery Market.

CHICAGO, ILL., March 26, 1907.

Development of water power is engaging a large share of attention in all parts of the country, and due to the progress made in engineering science, streams that have heretofore been regarded as inadequate in fall or volume for power purposes are now being so utilized. Cheap power is an important factor in the realization of low cost of production, and since water power, when available, affords the cheapest of all motive power for manufacture, it naturally follows that, under the pressure of modern industrial competition, the exhaustion of its possibilities should take precedence wherever possible over the more expensive methods of power generation. The growing need for economy in this direction has within recent years resulted in the establishment of many notable water power plants and others of importance are already under way. The availability of smaller streams is also the subject of closer investigation, and it is found in many instances that heads heretofore deemed too shallow for practical use are with modern appliances being made to yield power sufficient for the operation of small electric plants and factories. In consequence of the activity displayed along these lines, manufacturers of hydraulic machinery are overcrowded with orders for both light and heavy equipment. The opinion is expressed by one closely in touch with these interests, that the execution of maturing plans involving the use of hydraulic equipment will, at the present rate of development, be in many instances greatly delayed by the lack of plant capacity to furnish the necessary machinery. While this view may be a result of overestimate, it is nevertheless true that there is unprecedented activity in hydraulic power enterprises, and in plants devoted to the construction of hydraulic machinery.

Within comparatively recent years, the gas engine has risen from the experimental stage to a place of first importance among generative units, and, with steady improvement in economy and reliability of action, it now finds favor with power users, especially in small units. The number of shops engaged in the manufacture of gas and gasoline

engines throughout the country is surprisingly large, and from the number of new enterprises of this character reported it would seem that the aggregate output must be rapidly increasing. At the same time existing plants are steadily expanding, which fact may be taken as conclusive evidence of an extraordinary demand. The wonderful increase in the use of automobile and motor boats has furnished a new and seemingly inexhaustible field for motors of this type, and the extension of their use in stationary work is seen in all directions.

Dealers and manufacturers' agents report a little slackening in demand for heavy tools and machinery during the past week, but it is not believed that this is in any way significant of a permanent shrinkage. In other lines no change is observed, dealers complaining only of difficulty in getting tools and equipment necessary to supply the demand. While it is doubtless true that railroads will, as reported, be compelled to abandon many improvements planned, which involve the purchase of a large amount of machinery, it is believed on the other hand that, with what has already been contracted for and additional equipment that must in any event be purchased, the machinery interests will suffer but little from this action, so far as this year's business is concerned.

As an indication that railroad extension will not be wholly suspended, reference may be made to the plans of the Chicago, Milwaukee & St. Paul Railroad, which include the building of 1500 miles of road, together with considerable double tracking work, and the building of a large shop at Tomah, Wis., for the manufacture of railroad frogs. Work on this building, which will be of brick and concrete construction with frame roof trusses, has just been begun. Plans for the machinery equipment are being drawn and will be given out at an early date. The power plant will be equipped with high pressure boilers and modern electric equipment, from which power to operate the tools will be distributed through independent motor units.

The Stover Mfg. Company, Freeport, Ill., will, during the coming summer months, make large additions to its already extensive plant, for the manufacture of builders' hardware and agricultural machinery. These improvements when completed, will more than double the capacities of the foundry and machine shop. One structure, for which plans are being prepared, will be 80 by 260 ft., of brick and steel construction and designed for foundry purposes. These new departments will, of course, require a large amount of additional machinery for their equipment.

The Northern Engineering Works, manufacturer of cranes, hoists, and other machinery equipment, Detroit, Mich., is contemplating an addition to its plant consisting of a one-story building, 50 x 100 ft., which will be served by a 10-ton Northern electric traveling crane; also a two-story tool room, 30 x 50 ft. The new space will be added to provide better facilities for the manufacture of electric cranes, the output of which will be largely increased.

It has been decided by the management of the Utah Light & Railway Company, Salt Lake City, Utah, that in view of the inadequacy of the present equipment, a new power plant will be built. The details, however, have not yet been worked out, and specifications of machinery requirements are therefore not at present obtainable.

The power supply of the Cedar Rapids & Iowa City Railway & Light Company, Cedar Rapids, Iowa, has become inadequate to meet the demands of its growing service, and it is now proposed to increase the capacity of the power plant by enlarging the room space and installing additional machinery. The plans now under way contemplate the installation of three 500-hp. water tube boilers, coal and ash handling equipment, new piping system, and one 15-kw. turbo generator unit. This increase of boiler capacity will necessitate the building of a new stack, which will be constructed of concrete.

For the purpose of supplying additional current for distribution throughout its district, the Steamboat Springs Electric Company, Steamboat Springs, Colo., is planning to largely increase its plant. It is the purpose of the company to install an entire new machinery equipment, and plans are now being made to carry out this design. W. E. Carver is the superintendent.

Removals from that portion of Machinery Row, Chicago, where operations will be first begun for the erection of the new Northwestern Railroad depot are steadily taking place as fast as new locations are secured.

The Hydraulic Engineering Works, formerly in the Manufacturers' Building, 15 South Canal street, has moved to 68-70 North Jefferson street.

The Coy Mfg. Company has moved from the same building to 88-92 West Jackson Boulevard.

Seehausen, Wehrs & Co., dealers in engine room supplies, will on May 1 move from 11 South Canal street to 43-45 Franklin street.

The Advance Packing & Supply Company, which for many years has occupied the storeroom at 55 South Canal street, has secured new and more commodious quarters at 123 Franklin street.

The American Woodworking Machinery Company, which

for a number of years has had offices and warerooms at 43 South Canal street, will on May 1 move its offices to suite 917 Fisher Building. Stock will hereafter be carried in a new warehouse at Thirty-sixth and Morgan streets, the construction of which has just been completed.

New England Machinery Market.

WORCESTER, MASS., March 26, 1907.

The convention of the National Metal Trades Association at Boston last week brought together a large number of representative machine tool and other machinery builders from all over the country and afforded an excellent opportunity for getting at the general sentiment regarding conditions of business. Conversations with a large number of these gentlemen failed to reveal the slightest distrust in the future. There was a marked sentiment that a slight let-up in demand would be desirable, and a gradual decline to a slightly lower level is hoped for by many, on the theory that such a condition would be likely to remain a long time, unless something entirely unlooked for in the way of unfavorable influence should put in an appearance.

Among the dealers the feeling remains unchanged. They have had a first rate week, in some instances larger than those immediately preceding it, and inquiries have been plentiful. It is difficult to find a pessimist in any branch of the machinery trade. Sales are for single tools and small lots, footing into considerable totals.

The United Shoe Machinery Company conducted an auction sale of old machine tools at its works, Beverly, Mass., March 21, with a large attendance, considering the nature of the machinery which was disposed of. Everything was pretty old. In fact, nothing was included which the dealers had been seeking, which statement means much, for pretty nearly anything in the way of second-hand machinery is in active demand. However, the machinery brought very good prices, everything considered. Dealers purchased quite a number of bargains, and doubtless they will be able to dispose of them at satisfactory profits in this market. While no exact comparison can be made with results of other machinery auctions held since last summer, it is estimated that prices ruled just as strong as on any previous occasion.

There is a well authenticated report that the Boston & Maine Railroad has decided not to proceed with the construction of its new repair shops at Somerville this season. The information is not official; it seems to be impossible to get a definite statement of what it is proposed to do in this matter. But the statement comes from those who should know what they are talking about. The dealers are sincerely hoping that there will be a postponement until next year or the year after, when perhaps the general demand for machinery will have fallen off. They have no desire to participate in a struggle for railroad business on so large a scale, when everything they can get hold of in the way of machinery is being greedily absorbed by their customers. While it is true that if the railroad were to buy at this time early delivery would play little part in awarding contracts, yet the dealers have to take into consideration that their quota of the production of the various works which they represent will probably be as limited for months to come as it is to-day, and they would prefer to look after a number of smaller customers rather than a few big ones. The equipment for these works will be a very large one at the lowest estimate. One plan is to expend \$1,000,000 as the initial cost of the plant; another is to spend close to \$2,000,000, the question being, it is understood, whether car repair shops or both car and locomotive repair shops be established. In either case, the list of tools will be a very heavy one, and in addition there will be large power plant, electrical equipment, cranes, &c.

The New York, New Haven & Hartford Railroad is buying a sizable lot of woodworking machinery to replace equipment destroyed in the recent fire in the car repair shops at Readville, Mass. It is estimated that upward of \$40,000 worth of machinery was ruined. The experience of the purchasing department calls attention again to the condition of the woodworking machinery business. Deliveries are about the same as for machine tools. For example, the best deliveries on planers, taking the types produced in greatest number, are in June, and few machines can be had for that date. In most instances it is impossible to get woodworking machinery earlier than late in the year, and cases are reported where 1908 must be quoted.

There has been a change in the management of the Pacific Iron Works, Bridgeport, Conn. Frederick A. Parkhurst, manager, and Preston H. Skidmore, secretary, have severed their connection with the company. H. J. Porter has been elected secretary, and George M. Chase, formerly assistant superintendent of the works of the Eaton, Cole & Burnham Company, Bridgeport, has been made general superintendent. The company will continue the business,

manufacturing machinery, castings and other products, without change other than adding to the large present plant, which has for some time been inadequate for its purposes. The directors of the company are W. E. Burnham, formerly head of the Eaton, Cole & Burnham Company; H. S. Shelton, F. J. Kingsbury, H. J. Potter, and Henry A. Bishop. In connection with these works the recent incorporation of the Connecticut Metal Company is of importance. The company will occupy a portion of the Pacific Iron Works plant, the old boiler shop, for the manufacture of brass castings for electric and steam railroads, a line similar to that now produced by the Brady Brass Company, New York. The officers of the new company have not been chosen, but it is known that the same interests which control the Pacific Iron Works are back of the enterprise.

The Fairbanks Company is preparing a catalogue which will be devoted exclusively to its lines of machinery. It will be the first catalogue of its sort issued by the company and will be ready for distribution about June 1.

Some details of the great power project at Brattleboro, Vt., which includes damming the Connecticut River, have been given out. Provision will be made for developing 6000 hp. a day. A steel and concrete dam will be constructed, giving a total fall of 26 ft. The Connecticut River Power Company, which will carry out the project, will reserve 3000 hp. for the industries of Brattleboro, which do not at present use more than 1300 hp. The price fixed for power for Brattleboro, Hinsdale and Vernon is \$25 a year for units of 100 hp. or more, 10 hr. a day, and \$30 for units of from 30 to 100 hp. The great drainage area insures a practically perpetual power supply.

A newspaper compilation of the growth of manufacturing industries of Bristol, Conn., affords an idea of the very great average advance in volume of production in that typical Connecticut center, reckoned on the basis of the number of employees, from 1897 to 1907. Ten establishments, all engaged in metal trades, increased 94 per cent. in number of people on their payrolls, as shown in the following table:

	1897.	1907.	Inc.
Andrew Terry Company.....	65	220	155
New Departure Mfg. Company.....	150	600	450
Bristol Mfg. Company.....	110	300	190
Wallace Barnes Company.....	80	215	135
Sessions Foundry Company.....	250	550	300
Horton Mfg. Company.....	30	100	70
Bristol Brass Company.....	525	725	200
Sessions Clock Company.....	250	350	100
N. L. Birge & Sons Company.....	85	120	35
E. Ingraham Company.....	340	470	130

Total of additional hands in 10 years.....1,765

The Sessions Foundry Company, Bristol, Conn., manufacturer of iron castings, is increasing the capacity of its power plant, and has ordered a 550-hp. Rice & Sargent engine, built by the Providence Engineering Works, Providence, R. I., and a 400-kw. generator from the Westinghouse Electric & Mfg. Company, Pittsburgh.

The city of Cambridge, Mass., is to establish a power station at a cost of \$75,000, to provide heat and light for five school buildings and a library building. The details are not yet decided.

Cincinnati Industrial Notes.

CINCINNATI, OHIO, March 26, 1907.

Sealed bids will be received by the Board of Public Affairs of the village of Leesburg, Ohio, until April 9 for one 60-hp. gasoline engine connected by friction clutch on one side to triple pump of about 500,000 gal. capacity, and on the other side by friction clutch to air compressor having capacity of not less than 75 cu. ft. of free air per minute; 210 tons of standard cast iron water pipe and 6700 lb. of specials; 27 fire hydrants, valves and valve boxes, &c.

The Buckeye Foundry Company is contemplating the erection of a machine shop addition to its present plant that will cost approximately \$15,000.

The Weber Foundry Company will expend about \$25,000 increasing the present plant within the next month or two.

The F. A. Klaine Company, proprietor of the Good Will Stove Foundry, Front and Central avenue, will in the near future erect buildings costing in the neighborhood of \$20,000. The new molding shop will be 82 x 101 ft., of brick and steel construction, one story high. A four-story building, 32 x 93 ft., is to take the place of the present pattern shop, to be used for warehouse purposes and pattern shop combined. Edward Slocemeyer is the architect.

The Wm. Cramp Ship & Engine Building Company, Philadelphia, launched successfully March 26 the steamship Bunker Hill, building for the New England Navigation Company. When completed it will be operated between New York and Boston. The Bunker Hill is 375 ft. on the water line and has a draft of 22 ft. Its freight carrying capacity will be 1500 tons.

Government Purchases.

WASHINGTON, D. C., March 26, 1907.

The Isthmian Canal Commission will soon ask bids for one combination automatic self feed and lever feed drill.

The Bureau of Yards and Docks, Navy Department, Washington, will shortly ask bids for four 300-hp. water tube boilers, one fuel economizer, two boiler feed pumps, one feed water heater and other supplies for the power plant at Pensacola, Fla.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until April 2 for pneumatic drills, jacks, pumps and other supplies for the Eastern navy yards.

On April 9 the Bureau of Supplies and Accounts will open bids for the following machinery for the Portsmouth, New York and Washington navy yards: Schedule 533, hoisting engines; schedule 534, double action press; schedule 535, valve reseating machines, punch and shear, water tool grinder; schedule 536, magnetic separator, sand mixer.

Bids will be received until April 9 at the Bureau of Supplies and Accounts for pneumatic tools and drills, pumps, steam generator, &c., for the Eastern navy yards.

The Isthmian Canal Commission will receive bids until April 2, Circular No. 536, for power plant equipment, pneumatic tools, &c.

Bids will be received until June 3 at the office of the Constructing Quartermaster, Fort Bliss, Texas, for a deep well pump, two 40-hp. boilers and other supplies.

The Isthmian Canal Commission will receive bids until April 8 for an upright drill and other supplies.

The following bids were opened March 19 for machinery for the navy yards:

Bidder 3, The American Ship Windlass Company, Providence, R. I.; 5, Berry & Aikens, Philadelphia, Pa.; 7, Brooklyn Forge & Supply Company, Brooklyn, N. Y.; 11, Brown & Sharpe Mfg. Company, Providence, R. I.; 13, Bridgeman Bros. Company, Philadelphia, Pa.; 15, Becker-Brainard Milling Machine Company, Hyde Park, Mass.; 23, Central Metal & Supply Company, Baltimore, Md.; 26, Connellsville Blower Company, Connellsville, Ind.; 30, California Hydraulic Engine & Supply Company, San Francisco, Cal.; 36, E. J. Elting, Philadelphia, Pa.; 40, Fairbanks Company, Baltimore, Md.; 42, Fairbanks Company, Philadelphia, Pa.; 43, J. A. Fay & Egan Company, New York; 49, Fairbanks, Morse & Co., San Francisco, Cal.; 50, G. & W. Mfg. Company, New York; 51, Richard W. Geldart, New York; 52, J. Gilmour, New York; 53, Garvin Machine Company, New York; 62, Hill, Clark & Co., Boston, Mass.; 63, Hendey Machine Company, Torrington, Conn.; 67, Hyde Windlass Company, Bath, Maine; 78, J. B. Kendall, Washington, D. C.; 79, Lidgerwood Mfg. Company, New York; 86, Manning, Maxwell & Moore, New York; 95, National Electric Supply Company, Washington, D. C.; 97, Niles-Bement-Pond Company, New York; 100, Ole K. Olsen, New Orleans, La.; 101, Oliver Machinery Company, New York; 106, Prentiss Tool & Supply Company, New York; 109, P. H. & F. H. Roots, New York; 113, H. A. Rogers Company, New York; 122, B. F. Sturtevant Company, Hyde Park, Mass.; 138, Williamson Bros. Company, Philadelphia, Pa.; 139, Wm. H. Wood, Media, Pa.; 146, Yale & Towne Mfg. Company, New York; 149, Knox & Bro., New York; 152, James B. Clow & Sons, Chicago, Ill.

Class 1. Naval coal depot, City Point, Cal.—Construction of fresh water pumping plant—Bidder 30, \$3146; 49, \$2932.90.

Class 11. One electric winch—Bidder 3, \$1500; 67, \$1510; 79, \$1770; 138, \$1740.

Class 21. One high pressure blower—Bidder 26, \$575; 36, \$660; 52, \$526; 109, \$405; 122, \$440.

Class 22. Three universal milling machines—Bidder 11, \$8376; 15, \$7824; 40, \$8325; 86, \$7920; 97, \$7500.

Class 23. One universal milling machine—Bidder 11, \$840 and \$890; 15, \$825 and \$875; 53, \$850 and \$950; 97, \$825; 106, \$855.

Class 24. Five engine lathes—Bidder 53, \$2575; 63, \$3050; 86, \$2995; 97, \$2725; 106, \$2810.

Class 25. One automatic gear cutting machine—Bidder 11, \$1210; 15, \$650.

Class 26. One iron planer—Bidder 42, \$3200.

Class 31. One heavy planed miller—Bidder 15, \$1910; 97, \$1800; 106, \$1798.

Class 33. One second belt planer—Bidder 62, \$875; 106, \$778.

Class 34. One Oliver type C hand sawing machine—Bidder 43, \$184; 101, \$290.

Class 41. One hydraulic portable riveter—Bidder 7, \$857.75; 113, \$870; 139, \$790.

Class 42. One 500-ton reverse cylinder hydraulic press—Bidder 7, \$2475; 51, \$2569; 100, \$3644; 113, \$2470; 139, \$5250.

Class 57. One sectional water boiler—Bidder 5, \$558.36; 13, \$142.75; 152, \$171.55 and \$216.

Class 60. One melting furnace, parts, calking irons;

chisels and pipe jointers—Bidder 5, \$249.35; 23, \$195.50; 86, \$105.61; 152, \$155.37.

Class 109. Four 2-ton electric hoists and one 4-ton electric hoist—Bidder 50, \$2029; 51, \$2049; 78, \$2107.25; 86, \$2008; 95, \$1747; 146, \$2008; 149, \$2058.

The following bids were opened March 18 for supplies for the Isthmian Canal Commission, circular No. 354:

Bidder 1, the Atlantic Equipment Company, New York; 2, Bucyrus Company, South Milwaukee, Wis.; 3, Marion Steam Shovel Company, Marion, Ohio; 10, Chicago Pneumatic Tool Company, New York; 14, Fox Bros. & Co., New York; 17, Ingersoll Rand Company, New York; 22, Lea Mfg. Company, Port Huron, Mich.; 28, Manning, Maxwell & Moore, New York; 31, Pilling Air Engine Company, Detroit, Mich.; 44, Vandyke-Churchill Company, New York.

Class 1. Fifteen steam shovels—Bidder 1, type B, \$214,500, shipment to commence in 130 days and complete in 160 days, delivery Colon, and \$178,500, shipment to commence in 130 days and complete in 160 days, f.a.s. New York; 2, type B, \$187,025, shipment to commence in 165 days and complete in 260 days, delivery Colon, and type B-X, \$179,250, shipment to commence in 165 days and complete in 260 days, delivery Colon; 3, \$219,468.75, shipment to commence in 105 days and complete in 225 days, delivery Colon.

Class 2. Seven steam shovels—Bidder 2, \$49,000, delivery at Colon, commence shipment on July 28, 1907, and one shovel every seven days until completion; 3, \$61,897.50 and \$45,237.50, delivery at Colon, commence shipment in 105 days and complete in 225 days.

Class 5. One counter sinking radial drill—Bidder 14, \$387.50, 40 days.

Class 6. Two cold saws—Bidder 28, \$2692.14, 120 days; 44, \$2774, 100 days.

Class 7. Two automatic saw grinders and six carborundum wheels—Bidder 28, \$212, 120 days; 44, \$402, 100 days.

Class 8. Two pneumatic gear hoists—Bidder 10, \$505.35 days; 14, \$441.96, 70 days; 17, \$450, 21 days; 22, \$477, 60 days; 31, \$460, 42 days.

The Pilling Air Engine Company, Detroit, Mich., has been awarded class 235, 12 pneumatic hoists, \$1920, under opening of January 22, for supplies for the navy yards.

The following awards have been made for supplies for the navy yards, bids for which were opened March 5:

The Brown & Sharpe Mfg. Company, Providence, R. I., class 11, one No. 3 surface grinding machine, \$1265; class 12, two No. 2 surface grinding machines, \$971.80.

The Pratt & Whitney Company, Hartford, Conn., class 13, three Sigourney sensitive drills, \$276.

The Niles-Bement-Pond Company, New York, class 15, one 32-in. vertical drilling machine, \$535.

The Hendey Machine Company, Torrington, Conn., class 14, one 24-in. lathe, \$1835.

The Pilling Air Engine Company, Detroit, Mich., class 21, four pneumatic hoists, \$620.

J. Edward Ogden, New York, class 22, four triplex ammunition trolley hoists, \$335.20.

De Zouche, Harrison & Co., Philadelphia, Pa., class 61, two radial and two hand drills, \$447.

The Chicago Pneumatic Tool Company, class 62, two air cooled electric drills, \$215; class 63, nine pneumatic drills and six angle gears, \$797.50.

The following awards have been made for supplies for the navy yards, bids for which were opened February 19:

The North Penn Iron Company, Philadelphia, Pa., class 1, one electric traveling crane, \$4925.

The Pacific Tool & Supply Company, San Francisco, Cal., class 2, six lathes, \$4890.

The Henshaw-Buckley Company, San Francisco, Cal., class 3, two engine lathes, \$2390; class 4, six lathes, \$3870.

The Niles-Bement-Pond Company, New York, class 5, one turret lathe, \$3418.

Under opening of February 27, for one vacuum pump for the tender Myrtle, the bid of the Charles J. Jager Company, Boston, Mass., \$852.50, has been accepted.

The following awards have been made for supplies for the navy yards, bids for which were opened February 26:

J. B. Roache, Brooklyn, N. Y., class 124, seven hydraulic jacks, \$359; class 125, nine hydraulic jacks, \$465.

The Remington Machine Company, Wilmington, Del., class 251, one 16-ton refrigerating plant, \$4787.

The General Electric Company, Schenectady, N. Y., class 11, two induction motors and transformers, \$1126.84.

Catalogues Wanted.—The Union Steam Pump Company, Battle Creek, Mich., which is considering the purchase of three 150-hp. boilers or larger, 150 to 200 hp. engines, self-contained direct connected to generators, desires catalogues describing the various makes of boilers and engines. Address all catalogues to the general superintendent.

The Crescent Filter & Specialty Company, 1052 Annunciation street, New Orleans, La., is in the market for supplies, such as brass rods, screws, sheets, brass wire, phosphor bronze sheets, tobin brass, also lists and patterns for metal sign equipment.

Labor Notes.

Union molders at Indianapolis, Ind., have asked that the following minimum schedule go into effect in the foundries there on April 1: Floor molders, \$3.10; bench molders, \$2.90; coremakers, \$2.60, all for a 9-hr. day. Union foundries in that city have been paying a \$3.10 minimum for a 10-hr. day.

Union molders and coremakers at Salem, Ohio, recently renewed the demand they made in September, 1906, for a \$3 minimum.

Dayton, Ohio, foundrymen have decided not to grant the demand for which union molders there voted recently, namely, a 10 per cent. increase in wages and a reduction of hours from 10 to 9. The lowest rates now paid the journeymen floor molders vary from \$2.75 to \$3.05; for journeymen bench molders from \$2.50 to \$2.80. No recognized minimum exists. No written agreement has been in effect at Dayton for several years.

Molders of Williamsport, Pa., and vicinity have asked for a written agreement for a year providing for a minimum rate of \$2.75; for coremakers, \$2.50. They also desire a reduction in the hours of molding from 10 to 9 and an increase of 25 per cent. on all piece prices, with recognition of a Price Committee.

A dispatch says that the strike of common laborers at the East Chicago, Ind., mills of the Republic Iron & Steel Company and the Interstate Steel Company was settled last week, the men agreeing to accept a 10 per cent. advance from \$1.75 a day instead of a 25-cent increase.

The Erie Railroad has advanced wages of machinists at its various shops as follows: At Briar Hill, 1 cent advance an hour; Cleveland, Meadville, Port Jervis and North Side Shop, Jersey City, 1½ cents an hour; and at all other points on the system 2 cents an hour.

The Pittsburgh Valve, Foundry & Construction Company, Pittsburgh, has given its machinists an advance of 10 per cent. in wages.

A vote is being taken among the union molders of Chicago, and the members are asked to indicate on ballots whether they favor a written agreement or a verbal agreement; whether they are satisfied with present wages, hours and overtime; also, whether they favor leaving the questions of wages, hours, overtime and form of agreement in the hands of a committee to meet with the foundrymen, the committee to have full power to act.

M. F. Tighe, assistant secretary of the Amalgamated Association at Pittsburgh, has charge of a movement for organizing the roll turners employed in the iron and steel plants in the Pittsburgh and other Western districts that sign the Amalgamated scale. Circulars are being mailed to the members of the lodges stating that there is no reason why the roll turners could not band themselves together and establish a union as strong as any in the country.

The report of Commissioner Sherman of the New York State Department of Labor, for the last three months of 1906, shows that in that period what had been an unprecedented demand for labor fell off in some branches of industry. Of 93,000 wage workers in 85 different trades and occupations 14,352 were idle at the end of December, as compared with 10,223 one year previous. The Bureau of Mediation and Arbitration recorded 43 new trade disputes, as against 26 in the corresponding period of 1905 and 11 in the last quarter of 1904.

The extent of the 8-hr. demand to be made by the International Association of Machinists on May 1, or sooner, has not been made clear, but it is known that a vote has been taken in a number of districts. In Pittsburgh an advance in wages will be asked; in New York City and the nearby cities in New Jersey an advance will be asked, but it is not considered likely that an issue will be made of the 8-hr. day, though newspaper reports tell of a vote for the shorter day having been taken by District No. 15, including New York and vicinity, and of the grand lodge having sanctioned making a formal demand.

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HARDWARE

THE credit department of the average retail Hardware store offers as much opportunity for improvement and the establishment of efficient and businesslike methods as any other branch of the business. A great deal of attention was given to this subject at the recent series of State conventions, and it was shown to be a source of much care and perplexity to the general run of merchants. The time devoted to the matter was assuredly well spent, and the fact that it was so thoroughly covered is further evidence of the increasing importance and practical value of the deliberations at these annual gatherings. That the trade has been decidedly lax in its methods of extending credit and following up collections cannot be questioned. It would appear, however, that there is a strong and growing movement toward improvement in this direction, and that the near future will see these matters handled by Hardware merchants on a much more strict and businesslike basis.

Many and cogent reasons may be given for the laxity which has so long existed. In the first place, these matters are of such importance that they naturally devolve upon the managing head of the firm, whose cares and duties are often so many and varied that he can hardly give to any one branch of his work the attention required for best results. Vital as it is from the financial point of view, the credit department must be conducted in such an intelligent way as not to reduce trade by offending customers or giving the store an undesirable reputation for excessive rigor in its dealings. In rural communities or country towns, and even in small cities, the average store does not command the services of any one outside of the proprietor to whom such work might safely be intrusted. Carelessness and slipshod methods must be admitted in some individual instances, but it should be remembered that the proper following up of collections also requires no little bookkeeping and detail work, which, while easily handled in a good sized establishment, represents considerable hardship to the merchant whose business is not large enough to justify the employment of an extensive clerical force. The probability is, however, that the majority of merchants err on the side of leniency, and that timidity more than any other one thing is the fundamental cause of laxity in collections. For fear of losing trade, and especially in the face of aggressive competition, a merchant will often submit to no little injustice and irregularity on the part of the customer rather than take chances of offending him and losing his trade.

The American Hardware Manufacturers' Association is calling the attention of its members to an important matter affecting manufacturers who do business with Australia. A special agent of the Department of Commerce and Labor, Bureau of Manufactures, calls attention from Sydney to the fact that the Australian tariff imposes a duty equal to 6 cents a pound, full weight, on all catalogues, circulars, price-lists or similar advertising matter imported for distribution. Tons of American catalogues are said to be destroyed every year by Australian customs authorities because the business men to whom they are addressed decline to pay the duty referred to. It is suggested that this useless waste of time, money and opportunity may easily be avoided if manufacturers

will adopt a method commonly employed by their English competitors which gives uniform satisfaction. The American manufacturer should carefully address the catalogues, and by the same mail should send to the Comptroller-General of Customs or the Postmaster-General, or the Comptroller of Customs at Sydney, Melbourne, Brisbane, Adelaide, Freemantle or Hobart, as the case may be, full particulars in regard to the catalogues sent—to whom addressed, manner of shipment, route, &c.—and inclosing remittance in payment of duty. International money order should be sent and should amount to 3 pence, or 6 cents, a pound, full weight. The official so notified will advise the post office authorities, who will then promptly forward the catalogues to their destination. Another method practicable when very large quantities are sent out is to forward by freight to certain agencies in Australia who make a business of wrapping, addressing and forwarding, accompanying the shipment with instructions as to addresses and a remittance to cover duties, Australian postage and agents' charge.

Condition of Trade.

Spring business, with the coming of seasonable weather, is now fully under way, and both manufacturers and jobbers are occupied in supplying the demands of the trade. The changes in prices are comparatively few, but while there are not many announcements of higher quotations the tone of the market is strong and the tendency is still upward, as manufacturers' costs continue to increase. The railroads have at this time a conspicuous place in the public attention in their relation to commercial matters. The difficulties in connection with the delivery of freight, with which the trade is only too familiar, continue with little abatement, and the result is not a little inconvenient to manufacturers primarily and to the distributors and the public ultimately. Notwithstanding efforts to correct this troublesome condition of things, the delays in delivering material to the factories and goods to the merchants is perhaps as serious as at any time, as the roads are unable to cope with the great volume of business which is forced upon them. The disposition to control them, not always along reasonable lines and with grave danger of checking their enterprise, together with the intimate relation they bear to financial matters, have united in developing a condition of things, which, notwithstanding the existing prosperity, is regarded as a menace to the continued commercial and industrial well-being of the country. The hope, however, is entertained that these disturbing influences may not go too far and that confidence may not be unreasonably shaken. Fortunately, the consumption of goods goes on apace, and the complaint among the merchants is still of the difficulty of keeping their stocks full. While in some lines there is unquestionably more promptness in supplying goods, the many back orders placed long ago evidence the unrelaxed demands which are being made upon the factories. Sluggishness in collections is reported in some sections, but there is little serious difficulty experienced on this account.

Chicago.

The movement of seasonable goods has been greatly accelerated by the unusually warm weather prevalent throughout the West. With the comparatively high tem-

perature prevailing the full force of spring energy has been awakened, and a flood of orders that under other conditions would have come more gradually has been let loose upon the market. Merchants who have not yet placed orders for Wire Cloth and Wire Netting are now crowding them forward, and those who have bought are clamoring for undelivered shipments. Movement of these lines was given added momentum by the recent action of manufacturers in making a 5 cent per 100 ft. advance on Wire Cloth, to be effective April 1, and a $2\frac{1}{2}$ per cent. advance on Poultry Netting, to take effect at once. Although a large part of the season's requirements for retail stocks is covered by orders already placed, there is yet a large volume of business in smaller orders that will be affected by these advances. Owing to the floods about Pittsburgh and elsewhere, that recently caused temporary suspension of operations in several of the principal Sheet mills, the scarcity heretofore existing in this product has been sharply accentuated. Mill deliveries on Galvanized Sheets are not now promised short of 24 weeks from the principal sources of supply, though for select specifications outside mills are in some cases making shipments in considerably less time. Jobbers' stocks are, however, fairly well supplied, but prices are firmly held and will likely be advanced, particularly on lighter gauges; \$4.25 is already being asked from one or two warehouse stocks, and it is predicted that this price will, under stress of present scarcity and strong demand, soon become general. A marked improvement is noted by jobbers in the demand for small lots of Nails out of store, which is doubtless due to the increasing delay of mill shipments and urgency of consumptive demand. No complaint is heard of unsatisfactory trade conditions in any of the Hardware lines save that of delayed deliveries, which with the exception of a few products have much improved.

NOTES ON PRICES.

Wire Nails.—There is no cessation in the volume of demand, both in the way of new business and specifications on contract orders. The closing of some mills because of the floods has caused them to fall further behind in deliveries. This combined with scarcity of cars and a pronounced shortage of steel will further delay shipments. It is understood that some mills are able to command slight premiums over general quotations for reasonably prompt shipments. The market is firm and prices unchanged. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....	\$2.00
Carload lots, to retail merchants.....	2.05

New York.—Local demand continues moderate, but even under this condition slow and retarded shipments from mill makes it difficult for jobbers to keep stocks well assorted. Local prices are fairly well maintained notwithstanding the limited business. New York quotations are: To retailers, carloads, on dock, \$2.19; less than carloads, on dock, \$2.33; small lots at store, \$2.30.

Chicago.—An increasingly active market, combined with some mill shutdowns due to recent floods, have operated to lengthen deliveries in Wire Nails. There is no let-up in the demand coming from all sections of the country, which is flooding the market with orders. Prices remain unchanged, and quotations are as follows: \$2.15 in car lots to jobbers and \$2.20 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

Pittsburgh.—The mills affected by the recent flood are again in operation, but the tonnage in Wire Nails taken out of the market by the enforced shutdown was very considerable and will put the mills further behind on deliveries. There is still a great scarcity of cars and the supply of steel is utterly inadequate, these two conditions operating against the mills in making full output, and also in making shipments. The tone of the market is firm, and several mills advise us they are able to get slight premiums over regular prices, where reasonably prompt shipments are required. Quotations are as fol-

lows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....	\$2.00
Carload lots, to retail merchants.....	2.05

Cut Nails.—There had been a somewhat general idea among the trade that the Cut Nail Association would advance prices at the meeting held on the 26th inst. This, however, was not done, but former prices were reaffirmed. Demand is good and stocks held by mills and jobbers are poorly assorted on sizes most in demand. Quotations are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, \$2.05; less than carloads, to jobbers, \$2.10; less than carloads, to retailers, \$2.20. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 10 cents advance on Steel Cut Nails.

New York.—Jobbers' stocks are somewhat broken in assortment, owing to the tardiness with which shipments from mills are received. Local demand is comparatively light. Jobbers' quotations are on the basis of \$2.30 for small lots at store.

Chicago.—There is no change to be reported in demand for or movement of Cut Nails. Orders are plentiful and there is still more or less delay experienced in getting shipment. We quote as follows: Iron Cut Nails, car lots, to jobbers, \$2.30; to retailers, \$2.35; Steel, to jobbers, in car lots, \$2.20; to retailers, \$2.25.

Pittsburgh.—A serious car shortage exists, and the mills making Cut Nails are having trouble to get Steel promptly, and which is high in price. Stocks held by the mills, and also by jobbers, are very light, and on sizes mostly called for are badly broken. Premiums of 5 to 10 cents a keg are being paid by the trade to obtain reasonably prompt delivery. Quotations are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, \$2.05; less than carloads, to jobbers, \$2.10; less than carloads, to retailers, \$2.20. Iron Cut Nails at points west of Buffalo and Pittsburgh are held at 10 cents advance on Steel Cut Nails.

Barb Wire.—Demand has been accelerated by the unusual warm weather, and manufacturers find it difficult to keep up with orders. The shortage in Steel prevents a full output by the mills, and scarcity of cars delays shipments. For prompt shipments some mills are still asking premiums. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots.....	\$2.15	\$2.45
Retailers, carload lots.....	2.20	2.50
Retailers, less than carload lots.....	2.30	2.60

Chicago.—Unusually warm weather throughout the North and Northwest has brought the demand for Fencing Wire up to what is believed will be its maximum for the season. It is difficult for the mills to serve promptly such a demand precipitated from all sections at once. We quote as follows: Jobbers, Chicago, car lots, Painted, \$2.30; Galvanized, \$2.60; to retailers, car lots, Painted, \$2.35; Galvanized, \$2.65; retailers, less than car lots, Painted, \$2.45; Galvanized, \$2.75; Staples, Bright, in car lots, \$2.25; Galvanized, \$2.55; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—The shortage in supply of Steel and also in cars prevents the mills from getting out full output, and also from catching up on deliveries on which they are considerably behind. Some mills continue to ask premiums of \$1 to \$2 a ton for prompt shipment. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots.....	\$2.15	\$2.45
Retailers, carload lots.....	2.20	2.50
Retailers, less than carload lots.....	2.30	2.60

Smooth Fence Wire.—The temporary closing of mills on account of the floods in the Pittsburgh District, shortage of Steel and scarcity of cars, all combine to keep mills behind in supplying the heavy demand. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	\$1.85
Retailers, carloads	1.90

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12	12½	13	14	15	16
Annealed.....Base.	\$0.05	.10	.15	.25	.35	.45	.55		
Galvanized.....	\$0.30	.35	.40	.45	.55	.65	1.05	1.15	

Chicago.—No exception is found in Smooth Wire to the heavy demand now experienced for all such products. More or less delay is experienced in getting deliveries and the season is now at hand when manufacturers are in urgent need of stock. Quotations are as follows: In car lots, to jobbers, \$2, f.o.b. Chicago, and to retailers, \$2.05.

Pittsburgh.—The mills in the Pittsburgh District that were shut down by the flood have again resumed operations, but the loss of time, together with the shortage in cars and the scarcity of Steel continue to operate against output and shipments on which the mills are very much behind. The market is very firm, and premiums of \$1 to \$2 a ton are being asked in some cases for reasonably prompt shipments. We continue to quote f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	\$1.85
Retailers, carloads	1.90

The foregoing prices are for base numbers, 6 to 9.

Wagon Springs.—Exceptional activity in their line is reported by manufacturers of Vehicle Springs, &c. Orders already booked are said to be so heavy that it will be a long time before producers can hope to get down to an easy basis. Emphasis is laid on the enormous tonnage for Springs for automobiles, arising from the present boom in that industry. Some manufacturers have recently raised their prices ¼ to ½ cent per pound, and the market may be represented by the following quotations: Wagon Springs, Black and Half Bright, 4¼ to 4½ cents per pound; Bright, 4¼ to 5 cents per pound. Manufacturers' prices on Rivet Head Spring Seats in less than carload lots are as follows:

	Cents.
1¼ x 2 x 24.....	per pair 37 to 38
1½ x 2 x 25.....	per pair 38½ to 39½
1½ x 2 x 26.....	per pair 40 to 42
1½ x 2 x 28.....	per pair 44 to 46
1¼ x 3 x 28.....	per pair 55 to 57
1½ x 3 x 28.....	per pair 57½ to 59½
1½ x 3 x 28.....	per pair 60 to 65

Leather Washers, Pump Leathers, &c.—Manufacturers of Leather Washers, Pump Leathers, &c., state that they are having a heavy volume of trade and are finding it difficult to get leather enough to meet their requirements. Last year is generally referred to as the largest ever experienced, and prospects are said to be for a continuance of the demand. Moderate advances in quotations have been made by some manufacturers, necessitated, they explain, by increased cost of leather.

Shovels.—The trade has felt considerable interest in possible developments arising from the meeting of independent Shovel manufacturers held last week in Pittsburgh, as announced in our telegraphic dispatch. Many are disposed to question the likelihood of any noticeable effect on prices, but others think there may be a stiffening on the part of outside makers, especially in view of the heavy volume of business in this line, which has continued almost interruptedly throughout the winter, affording manufacturers little opportunity to accumulate stocks.

Calks.—Somewhat higher prices are being quoted by the majority of manufacturers of Toe and Heel Calks. Advances amount to about ½ cent per pound. One-Prong Blunt Calks may now be quoted at 4¼ to 4½ cents per pound, and One-Prong Sharp at 4¼ to 5¼ cents.

Coil Chain.—Manufacturers of Coil Chain are unanimous in reporting a heavy demand all over the country, especially for the smaller sizes. One company states that the demand has never been greater in its experience, and indications are wanting for any falling off in the near future. Many, if not all of them, are considerably behind their orders and are prevented from taking on new trade by difficulty in meeting the requirements of their

regular customers. Much difficulty seems to be experienced in obtaining raw material.

Trace Chains.—We give below the revised price-list on Long and Short Traces, Half Traces and Cow Ties adopted by the manufacturers February 15. The market may be represented in a general way by a discount of 60 per cent. from these lists:

Long Traces.

Bright or Black—Straight Links.		English size.		Per pair.
American or exact size.		English size.		
6½ feet, 6, 4.....	6½ feet, 8, 3.....	6½ feet, 8, 3.....		\$0.79
6½ " 8, 4.....	6½ " 10, 3.....	6½ " 10, 3.....		.90
6½ " 10, 4.....	6½ " 12, 3.....	6½ " 12, 3.....		1.04
6½ " 12, 4.....	6½ " 14, 3.....	6½ " 14, 3.....		1.20
6½ " 14, 4.....	6½ " 16, 3.....	6½ " 16, 3.....		1.40
6½ " 6, 3.....	6½ " 8, 2.....	6½ " 8, 2.....		.85
6½ " 8, 3.....	6½ " 10, 2.....	6½ " 10, 2.....		.97
6½ " 10, 3.....	6½ " 12, 2.....	6½ " 12, 2.....		1.12
6½ " 12, 3.....	6½ " 14, 2.....	6½ " 14, 2.....		1.30
6½ " 14, 3.....	6½ " 16, 2.....	6½ " 16, 2.....		1.55
6½ " 16, 3.....	6½ " 18, 2.....	6½ " 18, 2.....		1.85
6½ " 18, 3.....	6½ " 20, 2.....	6½ " 20, 2.....		2.25
6½ " 6, 2.....	6½ " 8, 1.....	6½ " 8, 1.....		1.07
6½ " 8, 2.....	6½ " 10, 1.....	6½ " 10, 1.....		1.20
6½ " 10, 2.....	6½ " 12, 1.....	6½ " 12, 1.....		1.35
6½ " 12, 2.....	6½ " 14, 1.....	6½ " 14, 1.....		1.55
6½ " 14, 2.....	6½ " 16, 1.....	6½ " 16, 1.....		1.85
6½ " 16, 2.....	6½ " 18, 1.....	6½ " 18, 1.....		2.25
6½ " 6, 1.....	6½ " 8, 0.....	6½ " 8, 0.....		1.30
6½ " 8, 1.....	6½ " 10, 0.....	6½ " 10, 0.....		1.45
6½ " 10, 1.....	6½ " 12, 0.....	6½ " 12, 0.....		1.65
6½ " 12, 1.....	6½ " 14, 0.....	6½ " 14, 0.....		1.90

Long Traces.

Bright or Black—Straight Links.		English size.		Per pair.
American or exact size.		English size.		
7 feet, 6, 4.....	7 feet, 8, 3.....	7 feet, 8, 3.....		\$0.86
7 " 8, 4.....	7 " 10, 3.....	7 " 10, 3.....		.90
7 " 10, 4.....	7 " 12, 3.....	7 " 12, 3.....		1.14
7 " 12, 4.....	7 " 14, 3.....	7 " 14, 3.....		1.32
7 " 14, 4.....	7 " 16, 3.....	7 " 16, 3.....		1.55
7 " 16, 4.....	7 " 18, 3.....	7 " 18, 3.....		1.85
7 " 6, 3.....	7 " 8, 2.....	7 " 8, 2.....		.93
7 " 8, 3.....	7 " 10, 2.....	7 " 10, 2.....		1.06
7 " 10, 3.....	7 " 12, 2.....	7 " 12, 2.....		1.22
7 " 12, 3.....	7 " 14, 2.....	7 " 14, 2.....		1.45
7 " 14, 3.....	7 " 16, 2.....	7 " 16, 2.....		1.75
7 " 16, 3.....	7 " 18, 2.....	7 " 18, 2.....		2.10
7 " 18, 3.....	7 " 20, 2.....	7 " 20, 2.....		2.55
7 " 6, 2.....	7 " 8, 1.....	7 " 8, 1.....		1.16
7 " 8, 2.....	7 " 10, 1.....	7 " 10, 1.....		1.30
7 " 10, 2.....	7 " 12, 1.....	7 " 12, 1.....		1.50
7 " 12, 2.....	7 " 14, 1.....	7 " 14, 1.....		1.75
7 " 14, 2.....	7 " 16, 1.....	7 " 16, 1.....		2.10
7 " 16, 2.....	7 " 18, 1.....	7 " 18, 1.....		2.55
7 " 6, 1.....	7 " 8, 0.....	7 " 8, 0.....		1.40
7 " 8, 1.....	7 " 10, 0.....	7 " 10, 0.....		1.60
7 " 10, 1.....	7 " 12, 0.....	7 " 12, 0.....		1.85
7 " 12, 1.....	7 " 14, 0.....	7 " 14, 0.....		2.20
7 " 14, 1.....	7 " 16, 0.....	7 " 16, 0.....		2.60

Half Traces or Butt Chains.

With Ring—Straight Links.		English size.		2 ft.	2½ ft.	3 ft.	3½ ft.
American or exact size.		English size.					
6 links 3.....	8 links 2	6 links 3.....	8 links 2	\$0.49	\$0.56	\$0.63	\$0.70
8 " 1.....	10 " 0	8 " 1.....	10 " 0	.75	.85	.95	1.05
8 " 2.....	10 " 1	8 " 2.....	10 " 1	.58	.67	.76	.82
8 " 3.....	10 " 2	8 " 3.....	10 " 2	.51	.59	.67	.75
10 " 1.....	12 " 0	10 " 1.....	12 " 0	.82	.93	1.04	1.15
10 " 2.....	12 " 1	10 " 2.....	12 " 1	.65	.75	.85	.95
10 " 3.....	12 " 2	10 " 3.....	12 " 2	.55	.64	.73	.82
12 " 2.....	14 " 1	12 " 2.....	14 " 1	.75	.86	.97	1.08
12 " 3.....	14 " 2	12 " 3.....	14 " 2	.62	.72	.82	.92
14 " 2.....	16 " 1	14 " 2.....	16 " 1	.86	.98	1.10	1.22
14 " 3.....	16 " 2	14 " 3.....	16 " 2	.72	.83	.94	1.05
16 " 2.....	18 " 1	16 " 2.....	18 " 1	1.06	1.19	1.32	1.45
16 " 3.....	18 " 2	16 " 3.....	18 " 2	.86	.98	1.10	1.22
18 " 3.....	20 " 2	18 " 3.....	20 " 2	1.06	1.19	1.32	1.45

Traces shorter than 24 in., same list as 24 in.

Short Traces—Straight Links.

Length in inches.		Exact sizes.		Per pair.	
				Hook and ring.	Two hooks.
24	8 links per foot, No. 3.....	24	10 " " " " " 3.....	\$0.65	\$0.72
24	10 " " " " " 3.....	24	12 " " " " " 3.....	.71	.78
24	8 " " " " " 2.....	24	10 " " " " " 2.....	.73	.80
24	10 " " " " " 2.....	24	12 " " " " " 2.....	.81	.88
30	8 " " " " " 3.....	30	10 " " " " " 3.....	.74	.81
30	8 " " " " " 2.....	30	10 " " " " " 2.....	.82	.89
30	10 " " " " " 3.....	30	12 " " " " " 3.....	.80	.87
30	10 " " " " " 2.....	30	12 " " " " " 2.....	.91	.98
36	8 " " " " " 3.....	36	10 " " " " " 3.....	.83	.90
36	8 " " " " " 2.....	36	10 " " " " " 2.....	.91	.98
36	8 " " " " " 1.....	36	10 " " " " " 1.....	1.10	1.17
36	10 " " " " " 3.....	36	12 " " " " " 3.....	.89	.96
36	10 " " " " " 2.....	36	12 " " " " " 2.....	1.01	1.08
36	10 " " " " " 1.....	36	12 " " " " " 1.....	1.20	1.27

No. 4, same list as No. 3.

Traces shorter than 24 in., same list as 24 in.

Cow Ties.

Open Ring, 4 In. Shut Ring, 3½ In.
Open and Shut Ring Patterns with T Bar.

	Open ring and T. Per doz.	Closed ring and T. Per doz.
3 feet, No. 6 or 2-0.....	\$3.90	\$3.60
3 " " 5 or 3-0.....	4.00	3.70
3 " " 4 or 4-0.....	4.30	4.00
3½ " " 6 or 2-0.....	4.15	3.85
3½ " " 5 or 3-0.....	4.25	3.95
3½ " " 4 or 4-0.....	4.55	4.25
4 " " 6 or 2-0.....	4.40	4.10
4 " " 5 or 3-0.....	4.50	4.20
4 " " 4 or 4-0.....	4.80	4.50
4 " " 3 or 5-0.....	5.55	5.25
4 " " 2 or 6-0.....	6.55	6.25
4½ " " 6 or 2-0.....	4.65	4.35
4½ " " 5 or 3-0.....	4.75	4.45
4½ " " 4 or 4-0.....	5.10	4.80
4½ " " 3 or 5-0.....	5.80	5.50
5 " " 5 or 3-0.....	5.00	4.70
5 " " 2 or 6-0.....	6.80	6.50
5 " " 0 or 8-0.....	8.50	8.00
6 " " 2 or 6-0.....	7.50	7.00

Merchant Pipe.—The scarcity of Merchant Pipe, arising from exceptionally heavy demand, has been accentuated by the recent floods in the Pittsburgh District. There has been a decided stiffening in the market, many mills having withdrawn prices altogether and accepting orders only for shipment at their convenience, subject to price adjustment at a later date.

Bull Rings.—Manufacturers state that Copper Bull Rings have been exceptionally slow in reflecting the increased cost of raw material. An advance has just been made, however, amounting to something over 10 per cent., which is said to bring the market up to a more equitable comparative basis. Following the change, the price of Rings to the retail trade may be represented by the following quotations: 2-in., \$1.15 per dozen; 2½-in., \$1.35 per dozen; 3-in., \$1.75 per dozen.

Rope.—No particular change has taken place in the Rope market as far as demand is concerned, which is reported as somewhat light, though some improvement is noticed as the season advances. The market is quite firm considering the comparatively light requirements. Quotations are as follows: Pure Manila, 13 to 13½ cents; B quality, 12 to 12½ cents; Pure Sisal, 9¼ cents; No. 2 quality, 7¼ to 8 cents; No. 1 Jute, ¼ in. and up, 9 cents; No. 2 Jute, 8½ cents.

Mouse Traps.—Higher prices are ruling on common wood choker Mouse Traps. Quotations of manufacturers show an advance of about 2 cents per dozen holes. The present market price to the retail trade may be represented in a general way by the quotation of 11½ to 12 cents per dozen holes.

Hatchets.—At a recent meeting of Hatchet manufacturers an advance of 5 per cent. on the lines controlled by the association was decided on. This includes Shingling Hatchets, Broad Axes and Hatchets, &c.

Conductor Pipe and Eaves Trough.—At the quarterly meeting of the Conductor Pipe Association, held last week, the present schedule of prices on Conductor Pipe, Eaves Trough, &c., was reaffirmed. Business in these lines is said to be excellent, fully reflecting the improved weather conditions leading to the renewal of building operations.

Solder.—Lower prices for Pig Tin have been reflected in a drop in the price of Solder, which is being quoted about 1 cent a pound below the recent market level. The present tendency, however, is toward firmness, and some of the loss has been recovered.

Sheet Zinc.—The manufacturers of Sheet Zinc have announced a further advance of 10 cents per 100 lb., bringing the base price up to \$8.60.

Window Glass.—The recent floods in the territory of some of the Window Glass plants caused a temporary suspension of work, materially curtailing the output for a week or more. The principal topic of interest to manufacturers and workmen is the date at which the Glass factories will close down for the season. A very general opinion is that the suspension will begin about May 1. Local business is moderately active. Jobbers' quotations

from jobbers' list October 1, 1903, are as follows: Greater New York, 90 and 10 per cent. discount on all sizes, single and double strength; outside of Greater New York, 90 and 5 per cent. for single, and 90 and 10 per cent. discount for double strength Glass.

Linseed Oil.—Spring demand is apt to be disappointing and slow to manifest itself, partly because it is expected too early by the trade. Buyers see no particular inducement to place orders at present figures, and crushers are equally slow to make sales upon which little profit can be realized. The bulk of the business is confined in this market to small lots for immediate requirements. New York quotations for jobbing lots are as follows, according to quantity: City Raw, 42 to 43 cents per gallon; Out of Town Raw, 40 to 41 cents per gallon. Boiled Oil is 1 cent a gallon over Raw.

Spirits Turpentine.—The lack of demand and competition between local dealers has caused a falling off of prices. This condition is probably temporary, but for the time being it has caused an unsettled feeling in the market. New York quotations are as follows, according to quantity: Oil Barrels, 76½ to 77 cents; Machine Made Barrels, 77 to 77½ cents per gallon.

HARDWARE CLUB OF NEW YORK.

At a meeting of the Board of Governors of the Hardware Club of New York, held last Thursday, the following officers were chosen: Eugene Bissell, president; Thomas F. Keating, vice-president; A. D. Clinch, treasurer, and A. G. Sherman, secretary. A further reference to the club and its new officers will be made in our next issue.

The North Dakota Hardware Company, Pingree, N. D., General Hardware, Furniture, Harness, &c., has recently incorporated with a capital of \$50,000. This incorporation also includes a branch at Cleveland, N. D., formerly known as the Cleveland Mercantile Company, but now operating under the corporate name as above. The officers of the company are: E. H. Toensing, president; Hon. G. A. Gladden, vice-president; C. E. Ruff, secretary and treasurer.

S. Spiro, 1920 Third avenue, Birmingham, Ala., has recently added a line of Shelf Hardware, Mechanics' Tools and Cutlery. He is building a wareroom, 50 x 140 ft., four stories. The tinning, roofing and heating department of the business will be removed to this building. Mr. Spiro also jobs Tin Plate, Sheet Metals and Tinner's Supplies.

The Keckonen Hardware Company, Calumet, Mich., wholesale and retail Shelf and Heavy Hardware, Stoves and Tinware, is letting contracts for the construction of a warehouse, 40 x 50 ft. This addition was made necessary by its rapidly expanding business.

The Werentin Bros. & Meier Company, Davenport, Iowa, has been incorporated with a capital of \$5000, to do a General Hardware, Plumbing and Steam Heating business. This firm succeeds S. M. Brown, whose Hardware stock has been taken over by the new company.

By a dissolution of partnership, E. D. Cable has retired from the Hardware firm of Kennish, Cable & Co., Kewanee, Ill. The firm, as reorganized, will be known as the Kennish Hardware Company, and will continue the business upon the same lines as heretofore conducted.

The West End Hardware Company has been organized at Boston, Mass., to carry on a retail Hardware business at 135 Leverett street. The capital stock is \$2500. Benjamin Baron is president and Abraham Baron, 121 Havre street, East Boston, treasurer and clerk.

McDermott & Devine have succeeded Case & McDermott in the Hardware business at Nelson, Neb.

PRICE-LISTS, CIRCULARS, Etc.

Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, etc., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.

H. O. NELSEN IRON WORKS, Knoxville, Tenn.: Catalogue K, illustrating and listing Valley Forge Wrought Steel Fences, Gates, &c.

WESTERN WHEELBARROW & MFG. COMPANY, Kansas City, Kan.: General catalogue No. 4, illustrating, describing and listing an extensive line of two and four wheel Trucks, Push Carts, Skids, &c., Wheelbarrows, Package Barrows, Lawn Swings, &c.

RALPH BROWN COMPANY, San Francisco, Cal.: Special Fishing Tackle catalogue for 1907.

KNAPP & SPENCER COMPANY, Sioux City, Iowa: Extensive series of sheets, dated January, 1907, to be added to the company's loose leaf catalogue or to replace old sheets.

GEO. Q. HILL COMPANY, Boston, Mass.: Illustrated booklet showing examples of special metal parts made to order and containing price-lists of Set and Cap Screws and Brass and Iron Machine Screws.

AITCHISON PERFORATING COMPANY, Chicago: Illustrated catalogues in English and Spanish referring to a complete line of Perforated Metals and giving tables of gauges, weights, thicknesses, &c.

BURLINGTON BLANKET COMPANY, Burlington, Iowa: Illustrated booklet referring to Hawkeye Refrigerator Baskets, for camping, picnicking, automobilizing, traveling, &c.

TRADE ITEMS.

THE GELLER, WARD & HASNER HARDWARE COMPANY, 412 and 414 North Fourth street, St. Louis, Mo., has just increased its capital stock from \$100,000 to \$200,000. This increase was made necessary by the rapid expansion of the company's business. The company will carry a much larger stock and add many new lines to their present assortment of General and Builders' Hardware, including Sporting Goods, Cutlery, Machinists' and Mechanics' Tools, Tin, Granite and Enamel Ware, Gasoline Launches and Canoes, &c. Preparations are being made to provide adequate space for all these lines, each department being made as complete as possible.

JOSEPH DIXON CRUCIBLE COMPANY, Jersey City, N. J., is distributing an attractive illustrated booklet, entitled "The Horse," which contains much information of interest to buyers and users of horses. It affords an excellent advertisement for Dixon's Graphite Axle Grease, one of the company's products.

THE GOULD COMPANY, Chicago, manufacturer of Pumps and Well Supplies, formerly located at 22-24 North Canal street, has moved to Ohio and Franklin streets, where the company now occupies a new four-story building, suitably equipped for the handling of its line.

THE PENN HARDWARE COMPANY, Reading, Pa., manufacturer of Builders' Hardware and specialties in Iron, Brass and Bronze Metal, has adopted a trademark which has been registered in the United States Patent Office. The trademark is of neat design and consists of the name Penn in a circle.

JAMES L. NEEFUS, 103 Reade street, New York, direct representative for a number of manufacturers of tools of various kinds, now has the agency for the Wrenches made by the Uwanta Wrench Company, Meadville, Pa., for New York and vicinity and export. In the line are the Uwanta Quick Adjustable Nut or Monkey Wrench, No. 1 or Plain Nut Wrench and Uwanta Combination Wrench, the latter, as the name suggests, being a Pipe and Nut Wrench. All are made in 8, 10, 12 and 15 in. sizes, and a stock is carried at the above address.

CHARLES J. GODFREY COMPANY, 111 Chambers street, New York, will on or about May 1 move to 10 Warren

street. The company handles complete lines of Sporting Goods, Arms, Ammunition and related merchandise.

J. M. C. MARTIN'S SONS, 102 Fulton street, New York, manufacturers of a general line of Brushes, the business of which was established in 1830, will on or about May 1 remove to 116 William street, which is in the same neighborhood and near by.

THE G. M. YOST COMPANY has removed its plant from Waynesboro, to Mechanicsburg, Pa., where it already has its machine shop in full operation. The foundry, now in course of construction, will probably be in running order by April 15, complete equipment for both foundry and machine shop having been purchased. The company has been incorporated and a charter obtained in accordance with the laws of Pennsylvania. An organization under the new régime has been effected by the election of the following executive force: I. E. Yost, president; G. M. Yost, vice-president and general manager, and T. J. Kennedy, secretary and treasurer. This company, it will be recalled, recently purchased the plant of the Peter A. Frasse & Company, New York, which last fall took over the machinery and material of the Snediker factory, which so long manufactured the Stephens Quick Acting Vise, Snediker X-L Quick Acting Vise and the Snediker Quick Acting Leg Vise. The Yost Company is continuing the production of this well established line, together with the Yost Parallel Machinist Vise and other tools.

THE MERIDEN CUTLERY COMPANY, Meriden, Conn., manufacturer of Fine Table Cutlery, will about May 1 next remove its New York headquarters to 21 Murray street, occupying a portion of the lower part of the building in conjunction with J. C. McCarty & Co., as is now the case at 10 Warren street.

J. C. MCCARTY & Co., 10 Warren street, New York, will on or about May 1 next remove to 21 Murray street, where they will have the street floor, basement and sub-basement, each 25 x 100 ft. in dimensions. This old established house represents directly a number of well-known manufacturers of Tools, general Hardware and House Furnishing Goods.

THE PULLMAN MFG. COMPANY, Rochester, N. Y., has absorbed the entire Sash Balance departments of both Anstice & Co. and N. R. Streeter & Co., also of Rochester. The two latter firms manufactured the Sensible Spring Sash Balance. This makes the third Sash Balance business absorbed by the Pullman Company during the past three years. The transfer includes patents, machinery, patterns, tools, dies, jigs, stock on hand, good will, &c.

THE J. M. CARPENTER TAP & DIE COMPANY, Pawtucket, R. I., recently broke ground for a new factory building, which will be of brick construction, practically fireproof, and will cover approximately 24,000 ft. of floor space, enabling the company to increase its output about 75 per cent. With its improved facilities the company expects to serve its patrons even better than in the past, and promptly fill orders for its well-known line of Thread Cutting Tools, including Taps, Dies, Die Stocks and Tap Wrenches, which have been on the market for many years.

An attractive booklet has been issued by Clark, Quilen & Morse, Peoria, Ill., jobbers of Hardware, &c., and manufacturers of Conductor Pipe, &c., Wash Boilers, Lard Cans and Cream Separators. The booklet is made up almost entirely of illustrations collected under the practical heading, "Why We Make Such Prompt Shipments." They include views of sample rooms and orderly arranged and heavily stocked stockrooms and shipping floors. Accompanying the booklet is a vest pocket reference book containing information, tables, price-lists, &c., for the use of tinnerns and Hardware merchants, together with blank pages for memoranda.

THE WHEELING STAMPING COMPANY, Wheeling, W. Va., will put on the market in the next three or four months a line of Galvanized Tubs, Buckets and Coal Hods. The company will install the necessary machinery, together with galvanizing plant, to manufacture these products.

TRADE WINNING METHODS.

This department is for the description of approved methods of carrying on and extending business, and a cordial invitation is given to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.

A MISCELLANEOUS WINDOW EXHIBIT.

THE window exhibit reproduced herewith was made by the Phillip Gross Hardware Company, Milwaukee, Wis. The idea of motion in the window was secured by an electric train, comprising an engine and two coaches, running at moderate speed on a track 25 ft. long. The train was termed the "Gross Special," and stopped occasionally at the "Grossville" station. A miniature

ing it a square appearance. Quite a number of *The Iron Age* advertising cuts appear in its pages.

SPRING OPENING ANNOUNCEMENTS.

MCNUTT & MUSGRAVE BROS., Hutsonville, Ill., will hold their spring opening on Saturday, Monday and Tuesday, March 30, and April 1 and 2. Preparations are being made for what should prove an attractive and interesting exhibition. There will be an especially large display of Farm Machinery, Vehicles, Harness and Hardware Specialties. Gasoline Engines, Feed Grinders, Manure Spreaders, Plows, &c., will be shown in operation, for the instruction and entertainment of the multitude of visitors which is expected as a result of the thorough advertising which the firm has given the event.



A Window Exhibit of Phillip Gross Hardware Company.

tunnel was provided in the shape of a boxed up display stand. On the right of the window were Toboggans, Sleds, Pool Tables, Parlor Games, Sporting and Athletic Goods, &c. The center was occupied with Skates, Sleigh Bells, Draftsmen's Instruments, fine Mechanics' Tools, Guns and Air Rifles. On the left were Mechanical and Electric Toys, miniature Steam Engines, large furnished Lunch Baskets for automobilists, &c. Tool Chests and Cabinets, Work Benches, Auger Bits in sets in fancy boxes, and mounted samples of fine Door Trimmings occupied the background.

The store has two windows of very large proportions, 25 ft. wide, 12 ft. high and 6 ft. deep, thus providing ample facilities for comprehensive exhibits. The floors of both windows are carpeted, and recovered with cheesecloth in some portions to add to the general attractiveness of the displays.

A NEATLY printed catalogue has been issued by the Gordon & Malven Company, Port Jervis, N. Y. The company handles General Hardware, Stoves and Farm Machinery, and also conducts a roofing, plumbing and heating department. The catalogue is 5¼ x 6¼ in. in size, giving

Additional help will be employed during the sale, and special inducements will be offered to buyers.

In connection with the circular announcing the spring opening the firm issues its second annual catalogue, about 7 x 10 in. in dimensions, with a striking red cover. The catalogue is well printed and freely illustrated. Prices are not mentioned in any case, although the quality of the goods handled is emphasized, as well as the fact that the firm is in position to make inducements in this regard. At the top of each page is the motto, "You'll find it pays to trade at McNutt & Musgrave Bros.," while reference is made at the bottom to "The Old Hardware Store on the Corner," by which style the business is well known locally. The catalogue is sent out in an envelope, the face of which carries an invitation to attend the spring opening, with an intimation that "there will be something doing at the old Hardware store on the corner in Hutsonville, Illinois."

Another spring opening is announced by the Wooster Hardware Company, Wooster, Ohio, on March 28, 29 and 30. The company does not so characterize it, however, but refers, more impressively, perhaps, to these as "Ad-

vertising and Bargain Days." This will be the tenth annual event of the kind which the company has engineered, all of them with marked satisfaction and substantial business results. The announcement in regard to the event is sent through the mails in the form of a collection of cards, about $5\frac{1}{2} \times 3\frac{1}{2}$ in., fastened together with an eyelet in one corner, which also answers the purpose of a hanger. The cards are in a variety of colors and call attention in a brief and effective way to some of the lines handled by the company, such as Wire Fencing, Cream Separators, Potato Machinery, Harness, Vehicles, &c. A leaf is also included which on being returned to the store during the special sales days will entitle the holder, if an adult, to a Buggy Whip free of charge, no purchase being necessary to secure the souvenir.

J. M. DAVIS & SONS' HOUSE ORGAN.

WE have heretofore had occasion from time to time to refer to the interesting house organ, under the title of "The Hardware Bulletin," issued by J. M. Davis & Sons, Hardware merchants, Oakland, Md. Special prominence is given in the February issue, which, by the way, is the first number of the second volume, to the

Cash System

adopted with the beginning of the present year. Cash with order is the object of this system, but accounts are also opened when absolutely necessary by agreement and contract, payable at a stipulated time. The reasons for making this change in transacting business with its customers and the advantages secured by it are thus referred to by the firm:

We are making this change for several excellent reasons and only after carefully considering all sides of the question. We believe it will be in every way a distinct gain to our customers, even more than ourselves.

In a cash business, all losses on bad accounts, for whatever cause, are avoided; bookkeeping and collection expenses are done away with; there is no possibility of disputes and wrangles over accounts; the merchant always has ready money to buy goods at the lowest spot cash prices, and to profit by all discounts for cash.

To make up for these losses and various expenses, we have been forced to charge enough for our goods to cover them by the profits. Every store doing business on a credit basis must do this—or quit.

The people of this community want low prices, they want us to meet outside competition, to which they must pay cash. We can do it on a cash basis—in fact, can guarantee you at least a good per cent. saving on your purchases.

This change of policy does not mean a sacrifice of quality or going back to the standards we have set ourselves. In every single item we can and shall give you better goods for the same price or the same article for less where there has not been an advance in prices.

This change, too, implies no question of or reflection on any one's ability to pay what he honestly owes or his willingness—it simply gives us the means to serve all our customers better.

The generous patronage you have given us we appreciate. We want you to continue it and shall make it richly worth your while by the much closer prices cash business will enable us to quote.

In adopting a cash system we have contracted to open accounts when necessary on a cash basis, by agreement and contract payable at a specified time.

Price the Same to All.

Emphasis is also laid on the fact that the store has but one price, that which appears in plain figures in connection with the goods. A conspicuous announcement to this effect continues:

You do not have to dicker—you, your neighbor and our customers from out of town all pay just the same—no more, no less.

We have no elaborate system of price marks—letters, figures or fanciful characters, that may mean one thing to you and something quite different to the customer before you or the one after.

Everybody pays the same—and you know the price the instant you see the price and card—you don't have to ask the clerk.

So far as quality and satisfaction is concerned, money back for the asking is the platform.

A Standing Invitation.

The February "Bulletin" contains 24 pages, most of the space being occupied with announcements relative to

season goods. Paints and Fencing being specially featured. Attention is called to a special 5 and 10 cent sale covering "a host of little things of everyday use at prices surprisingly low—thanks to a number of fortunate purchases." A very cordial invitation to visit the store is extended to the public to "Come to Look—Never Mind About Buying," in the following terms:

We want you and every one else to get acquainted with our store and know just what our stock is. We won't urge you to buy, if you come in. If one of our clerks does that—tell us, please.

Look around—all over the store—everywhere in each department. If you want to examine any merchandise more closely, ask one of our clerks to show it to you—feel perfectly free about it, too.

We want you to feel at home in our store. That feeling can result only from frequent visits and a repeated test of our sincerity in making you to feel perfectly at home here.

REQUESTS FOR CATALOGUES, Etc.

The trade is given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS for catalogues, price-lists, quotations, &c., have been received from the following houses, with whom manufacturers may desire to communicate:

FROM BERGER-BEAN HARDWARE COMPANY, Eugene, Ore., which has succeeded to the Hardware, Stove and Implement business of F. J. Berger.

FROM WILLIAM WARNOCK COMPANY, which has recently opened a store at Sergeant Bluff, Iowa, and will handle Hardware, Stoves, Tinware, Pumps, Paints, &c. The firm is composed of William Warnock of Sioux City and W. F. Goudie.

FROM H. B. FLETCHER, Govan, Wash., who has bought the General Hardware and Harness business of Theo. Bodeau.

FROM FARMERS HARDWARE COMPANY, Sweetwater, Texas, E. L. Frost and Louis Horne, managers, which has lately begun business with a capital of about \$17,000, buying the stock of Brown Hardware Company, Temple, Texas.

FROM SANITARY PLUMBING COMPANY, Oswego, N. Y., which has lately incorporated. The business will practically be conducted under the auspices of the Oswego Hardware Company.

FROM THE SEYLER HARDWARE COMPANY, wholesale and retail, Marietta, Ohio, which desires catalogues and price-lists relating to Shelf and Heavy Hardware, Tools, Cutlery, Tinware, &c. The company's former collection of trade literature was destroyed in the flood, which visited that section of the country, 14th to 20th inst. The company had 12 ft. of water on the main floor and suffered damage to the extent of about \$2000, but is still doing business at the old stand.

FROM CHAPMAN & STONE HARDWARE & FURNITURE COMPANY, North Birmingham, Ala., handling Hardware, Stoves, Tinware, Glassware, Crockery and Furniture. This business was started about three months since.

A. Z. BOYD, manufacturer's agent, now located at 56 Reade street, New York, will move April 1 to 126 Chambers street, which will afford larger quarters needed for his expanding business. Among the manufacturers represented by Mr. Boyd are Wells Bros. Company, Keystone Mfg. Company, Massachusetts Saw Works, Erie Tool Works, Baldwin Forging & Tool Company, Buhl Malleable Company, Hindley Mfg. Company and Penberthy Injector Company.

COLUMBIA ENGINEERING WORKS, Portland, Ore., announces that as it has discontinued its engineering and machine shop departments and is specializing in the manufacture of Steel Castings and Steel Logging Blocks and Tools, it has adopted the more appropriate name of Columbia Steel Company.

"CONSIDER THE CONSUMER."

FROM A SPECIAL CORRESPONDENT.

THE California State Retail Hardware Association in convention at Los Angeles, March 13, 14, 15, was characterized by two notable features. First, a large attendance, several hundred members filling every seat in the Odd Fellows' Hall, where the meeting was held. Second, the boldness of the remarks on the part of some of the speakers. Hardwaremen meeting at the various conventions are accustomed to listen to flattering speeches in which the dignity of the trade and the integrity of the members are lauded to the skies. In most conventions the traveling men are the representatives of the jobbers. One by one they are called upon and in neat little speeches soft soap the retailer, declaring that their houses are loyal to the retailer and are wholesale exclusively. They can do nothing else as they meet the retailer and must keep on the good side of him—they are the buffers between the jobber and the retailer and get all the kicks.

The California convention was fortunate in having on the programme a gentleman formerly for a number of years in the wholesale Hardware business at San Francisco, but now in another field. Consequently, with a thorough understanding of the situation and with no wires to pull or favors to curry, he put some matters before the convention worthy the consideration of Hardware merchants everywhere. Taking as his text the commandment "Thou shalt not steal," he cautioned the retailer to "consider the consumer," particularly in the regulation of his profits by combination with other merchants, to avoid putting on a commodity all it will stand, and a little more. The question of the amount of profit goods will bear must be worked out by the retailer, according to local conditions, but he will be greatly helped if he will remember the consumer.

He said that Hardwaremen as a rule resent the thought of low prices, contending in their pride that "it is not the cheapest but the best store I want." Let the Hardwaremen adopt another slogan and aim to have "the most popular store in town." Let him have less combination with other dealers and more with the consumer. When the Atlantic and Pacific Telegraph Company, now the Western Union, was in operation at a time when telegraphy was young, the question of reducing the rate from 50 to 25 cents for 10 words was brought before the directors by one of the junior superintendents. Again and again this plan was turned down, but in season and out of season he preached 25 cents for 10 words until a trial demonstrated its wisdom.

If the merchants present at the convention forget everything else, let them *consider the consumer*. It must be noted that if they really add but 25 per cent. profit, as some claim they do, they are on the right road to having the most popular store in town, and will in turn be considered *by* the consumer.

THE CAROLINAS HARDWARE ASSOCIATION.

THE Retail Hardware Association of the Carolinas will hold its annual meeting in Charlotte, N. C., on July 9, 10 and 11. The headquarters will be at the Selwyn Hotel, where the sessions will also be held in the hotel convention hall. The South Carolina Association, of which this organization is the outgrowth, was formed three years ago. As a result most of the members are South Carolina merchants, although quite a number of their brethren to the north have affiliated with the association since the last annual meeting, when the name was changed to cover both States. It is hoped that the holding of the convention at Charlotte will also have some influence in inducing North Carolina Hardwaremen to identify themselves with the association.

Arrangements for the meeting are already under way and the committee in charge will make every endeavor to provide an interesting and attractive programme for the three days' gathering. Among features of entertainment determined upon are a reception at the Selwyn Hotel or Southern Manufacturers' Club and a shooting contest.

A Hardware exhibition by manufacturers has also been determined upon, and assurances have been received from a number announcing their intention of being represented. Space for this purpose has been arranged for at the City Hall.

Elliott Dunn, Charleston, S. C., third vice-president of the association, has taken charge of the publicity end of the convention, which will permit Secretary Paul W. McLure, Greenwood, S. C., to give attention to other phases of the association work.

TERMS OF PAYMENT.

THE following circular, issued by the M. B. Schenck Company, Meriden, Conn., states in a clear and businesslike fashion the terms on which their goods are sold, explaining among other points the conditions on which the discount for cash in 10 days will be allowed. It is thus calculated to inform the trade in regard to good business practice and to correct the very serious laxity which permits merchants not infrequently to deduct the cash discount in remittances made after the 10 days have elapsed:

All prices, aside from contracts fully specified, are subject to change without notice. All contracts are liable to cancellation when terms are not complied with.

TERMS OF PAYMENT.

Our net terms are invariably 30 days.

If remittance is actually mailed within 10 days from date of bill a discount of 2 per cent. will be allowed. Otherwise payments must be made within 30 days for full amount of bill.

Delay in deliveries will not be considered in the time allowance for the 10-day cash discount. Remittances not conforming to this will in no case be accepted.

Actual freight to destination, not exceeding 50 cents per 100 lb., allowed.

Positively no freight allowed on less than 150 lb.

Errors, shortages, &c., or the nonarrival of freight bills, need not enter into the 10-day cash problem. We will promptly remit for such freight bills or errors, on receipt of proper notification.

In other words, we desire to remove every alleged obstacle to prompt payment of bills according to our terms, which we make invariable.

Deliveries will be made with utmost promptness possible under the circumstances. We have recently added nearly 100 per cent. to our facilities and must keep on adding to keep up with the demands for our goods.

The enforced carrying of immense stocks of all kinds, from three to six months in excess of all ordinary requirements, in order to avoid dangerous delays in filling orders, the additional delays in deliveries of same to us, and the exceedingly narrow margins of profit on which we do business, forbid the taking of any liberties whatever with our terms of payment.

The limiting of prices in orders sent us should be omitted, unless of importance. It makes no difference whatever to us, but may waste valuable time to our customer. Prices for the time being are invariable and always as low as they can be made.

This notice is sent to every customer, although a very large share of them observe our terms with gratifying promptness. They have exactly the same conditions to meet as all our customers, and they never had occasion to complain of any variation by us from the "square deal."

A REORGANIZATION has taken place in the East Asian Mercantile Company, 127 Duane street, New York, which is operating through trade connections in Siam, Straits Settlements and the Malay States. On March 9, F. J. and T. E. Oliver resigned as officers of the company, and with J. H. Oliver sold their stock holdings to C. B. Rice and L. R. Hunter. The new officers of the company are: President, C. B. Rice, Eastern agent of the Baker Electric Vehicle Company; vice-president, M. A. Cheek; secretary, J. C. Currie; treasurer, L. R. Hunter. The Messrs. Oliver, who are associated in Oliver Brothers Purchasing Company, state that they withdraw from the company with the best of feeling toward it, their only reason being that they find it necessary to devote their undivided time and attention to their domestic buying business.

W. B. Fox & Brother, 21 Warren street, New York, have secured the services of J. W. Johnson, an experienced Hardwareman, who will be located in their New York office. Mr. Johnson was formerly of the firm of Johnson, Coleman & Graham, Selma, Ala., which was lately merged with Carothers, Rogers & Fowlkes under the style of Selma Hardware Company.

Looking Forward.

BY VIATOR.

DURING the past year Mother Earth has yielded abundantly. Harvests have been unprecedented. Our farmers are prosperous. Mortgages on farms are the exception and farmers' bank accounts the rule. This prosperity has advanced our labor, advanced materials and in many cases advanced transportation. It has kept our industrial wheels turning, and the manufacturers have without difficulty disposed of their product at home; hence they have been content and have made no special effort to conquer foreign fields.

I am not a pessimist, but there may come a time when King Cotton and the corn and wheat fields may fail to contribute to the national wealth, thus reducing the purchasing power of our farmers. How are we then to dispose of the manufacturers' product at home and give our laborers employment?

Activities of Other Nations.

England keeps her wheels turning on foreign trade, and keeps everlastingly "at it" to extend it. She never sleeps. If she were content with her home trade, two-thirds of her furnaces would be out of blast, and two-thirds of her machinery would be idle. She makes three-fourths of the Table and Pocket Cutlery for the world, excepting the United States and Germany, and a like quantity of steel, &c. She brews ale for the world.

But this is the result of everlasting effort to introduce her wares in every nook. The managing son of to-day is reaping the benefit of the labors of past generations.

Germany is making rapid strides in her industrial development by reason of her systematic search for new fields to conquer. Krupp of Essen sends its product to every part of the earth excepting the United Kingdom and the United States.

Solingen ships her Cutlery to the Zululand, Java, China, Japan, India, &c. She has the market of the world, excepting the United States, for fancy and lighter grades of Cutlery, and now nearly controls the Razor market of the world. She even has a large outlet in England, the parent of the Cutlery industry, for ladies' and fancy Knives.

Belgium is making rapid strides in the development of her Firearms industry. If a merchant in Bahia wants a Gun with a red or blue stock and an image carved thereon, he can get it in Belgium. No country is too remote for them, nor the specifications too unusual.

Great Distances.

Should the day come when the American manufacturer needs a foreign outlet he will find that it takes time to establish it. It is not like sending a salesman to Chicago or St. Louis, where his goods are established, and which points may be reached in 18 to 24 hr. We must remember that we are 36 days from Bangkok, 32 days from Shanghai, 33 days from Hongkong, 25 days from Melbourne and 26 days from Calcutta.

Steamers to these countries run on an average twice per month, so when we take into consideration the delay in departures on each end and the going and coming of mails it takes, say, three months to get a reply from Bangkok, even if the merchant is sufficiently enthused to send an order immediately. But the foreigner is a procrastinator, and he may want two or three months to think it over.

Habits of Foreigners.

Then, too, we must learn the habits of foreigners. We must learn that a Chinaman will not give a written order, for he thinks his word as good as a bond. It is acknowledged that a Chinese merchant considers his business obligations as sacred as his Confucius or his Buddha. It is a prison offense to fail.

We must learn that the German or Frenchman can best be reached through their stomachs, the English and

Scotch through their managerial dignity. They are not as accessible as we are. It is a case of ringing door bells and waiting in an anteroom after the card is sent in until it pleases his managing directorship to receive his visitor.

The Question of Languages.

The American seems to overlook the fact that English is not spoken everywhere. We may find in Germany that many of the larger merchants and manufacturers speak English as well as we do; still if we could address them in their own language we could get much closer to them.

The study of languages should be taken up in earnest. In Germany, English, French and Spanish are spoken in most any business concern of importance, but if we are to be a progressive, industrial nation and set out to conquer the world we should not be content with these, and should add Japanese, Russian and Chinese. These added to those mastered by Germany would carry us around the world. While we as Americans are not enthusiastic in the study of languages, our weakness in that direction may be overcome.

Employment of Foreigners.

There are in our large universities students from Japan, Russia, China, Java, India, Siam, &c., most of them sons of rich men. Any manufacturing concern could secure the services of three or four of these at a nominal figure, as they are eager to learn our business methods. They could be induced to serve for one or two years, and they would be helped in many ways.

Being sons of rich and influential sires they may be the means of establishing business connections with their countries, which would prove profitable to those employing them. Such students would not be more expensive than our own young men, and having educational advantages, speaking our language, &c., they could be employed in most any clerical capacity, besides translating letters coming from or writing letters to their respective countries. I venture to say that any such young man could influence sufficient foreign business to balance his salary account.

These young men of good birth and education would also exert an incalculable influence on our young men, for all nations have characteristics which are worthy of our consideration. We ourselves are known the world over as the strenuous branch of the human family, so the German stands for military precision, the Chinaman for commercial honor, the Japanese for exceptional detail, the Englishman for birth and conservatism, the Russian for his awe of law and authority.

Enormous Fields To Conquer.

We Americans glory in our achievements, are patriotic, but the average American seems to think that the world's boundary is the Atlantic Ocean on the east and the Pacific on the west.

Do not let us forget that we have a population of nearly 90,000,000 people to a territory of 3,751,214 square miles. Russia has a territory of some 8,660,395 square miles and a population of some 135,000,000 souls, while China has a territory of 4,277,170 square miles and a population of 426,447,325.

Is It Worth While?

It is worth our while to study the wants of these people? As we have conquered the problem of manufacturing at a minimum cost, is it not prudent for us to take advantage of our exceptional manufacturing facilities and the abundant supply of coal, iron, copper, &c., and take up the problem of supplying our brethren beyond the seas?

The Farmers' Hardware Company, Clay City, Ind., successors to Smith & Schafer, has been incorporated with a capital stock of \$12,000, to do a General Hardware, furniture and Implement business.

EVOLUTION OF A FOUR-TINE MANURE FORK.

TWENTY-FIVE expert toolmakers and 18 assistants are required to manufacture a four-tine Manure Fork that one can buy for about 75 cents. Thirty-three intricate machines, forges and devices of special invention, and worth thousands of dollars, are also employed in the making of this Fork. This interesting information is furnished by the American Fork & Hoe Company, Cleveland, Ohio, in its free book, "Tools and Their Uses," which has been issued in the interest of its True Temper line of farm and garden hand tools.



Fig. 1.—Blanking.



Fig. 2.—Center Headed.



Fig. 3.—Shank Drawn.



Fig. 4.—Split and Spread.

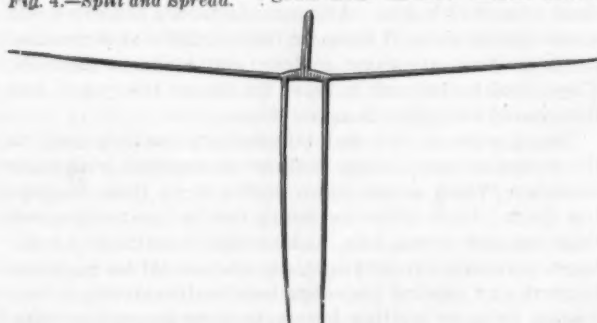


Fig. 5.—Rolling the Tines.

and expert ability is put into the making of fine modern tools.

The first operation is that of blanking. A large power machine operated by two men cuts the form shown in Fig. 1 from a steel bar which has been heated in a furnace.

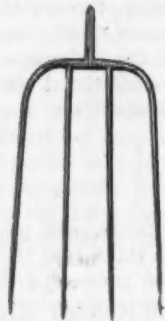


Fig. 6.—Shaping.

The form is then center headed, as shown in Fig. 2. This form is the result of heating the preceding form and subjecting it to the operations of another large special machine operated by one man. The indentation on the under side produces the space between the two center tines, making the head the right size and injects the superfluous metal into the shank part.

In the third step the bar is shank drawn. The last form is heated and a shank is drawn from the little keystone appendage, and pointed by means of a large machine hammer operated by one man.

The steel bar is then split and spread—that is, the two ends of the bar are heated, cut and spread so as to form four projections, as shown in Fig. 4. These projections are to provide the tines of the Fork.



Fig. 7.—Trimmed and Pointed.

The tines are then rolled, Fig. 5. The four extending arms of the last form are each separately rolled and lengthened into the proper size for the tines. One furnace and an immense machine operated by two men are necessary at this stage. The work is difficult and takes much time and skillful workmanship.

In the next step, Fig. 6, we see the

piece beginning to take the form of a Fork. It is now shaped. The steel is heated again and subjected to the operation of two machines. The hammer and anvil are also brought into use by the expert operator, who inspects and trues up the fork at this stage.



Fig. 8.—The Finished Fork.

The Fork is now ready to be trimmed and pointed, Fig. 7. The ends of the tines are cut off evenly and of the proper length by a machine with one operator. Then it passes to a special machine, where one man does nothing but put sharp, smooth points on Forks.

The most important stage in the Fork's production comes when it goes through the last actual forging shop operations to be dish, shaped and tempered.

The Fork in its unfinished shape up to this stage is completely heated and placed in a machine former, which gives it the proper dish and final accurate shape.

Tempering Process.

The Fork then goes through the secret true tempering process, perfected by the company after years of experience and experimenting. For obvious reasons the process is not made public. It is claimed for it, however, that it brings the tool up to the highest degree of toughness and gives the elastic "spring" so much sought after by toolmakers.

During the final operations the Fork is critically inspected and trued up on the anvil by hand and hammer. The men who do this work are experts, skilled to the highest degree in toolmaking.

Testing the Fork.

Three rigid tests are now applied to the Fork to see that it has the proper elasticity of temper, the required toughness of temper and accurate dimensions. These tests are intended to break or bend the Fork in case there are any imperfections in the steel or temper. Only a Fork of high quality will stand such severe tests, and seldom will any Fork receive such hard usage on the farm.

After the tempering and testing the Fork goes to the finishing shop, where it is subjected to the operations of three machines. It comes out with a bright, smooth, metal polish. In the next step the Fork is treated to a special liquid solution, which prevents rusting or corroding. It is then stored away, preparatory to driving on the handle, ferrule cap and ferrule.

THE NEAL & BRINKER COMPANY, 18 Warren street, New York, recently completed the first 10 years of its business existence. At the annual meeting, held early in the month, some important changes were made in the way of promotions to deserving employees, who have been advanced, on their merits, to positions of increased trust and responsibility. The officers are as follows: Edward B. Brinker, president; Edwin T. B. Penman, vice-president; Everett L. Easton, treasurer, and A. Clifford Craig, secretary. Mr. Penman has been connected for several years with the company as a salesman in the contract department and is thoroughly posted in the line. Mr. Easton was both secretary and treasurer, and has been with the house six years. Mr. Craig has had charge of the Builders' Hardware department, and has also been with the company several years. It is the intention of the management to divide up the departments and give the chiefs a chance to demonstrate their ability to increase business and still further promote the interests of the company. The department heads are charged with the selection of their subordinates, with power to advance or discharge, in accordance with results accomplished.

THE BRODERICK & BASCOM ROPE COMPANY, St. Louis, Mo., manufacturer of Wire Rope, will on or about May 1 remove its New York branch house from 19 Murray street to 76 Warren street, where there will be more room and much better facilities for transacting business.

THE PROBLEM OF THE GENERAL MERCHANT.

BUTLER BROTHERS, Chicago, have recently issued a booklet entitled "The Problem of the General Merchant," which will be found especially suggestive, stimulating and helpful by retailers generally. The purpose of the booklet is to "point out how the average general merchant for and by himself can better his own conditions." This it does in a very practical and definite fashion, although the reader is reminded that after all his success as a merchant must come as a result of his own individual effort. Ways and means are suggested, the intelligent observation and carrying out of which will be found effective in promoting success, but the retailer must be alive, aggressive and assiduous besides.

The booklet is divided into 15 chapters, which present the important topic to which it is devoted in an attractive and systematic manner. The opening chapter urges the merchant to keep up with the times, to deal with things as they are, not as he would have them; to get out of old ruts and avoid falling into new ones.

In the second chapter it is remarked that the first essential in making an average store pay is that its proprietor should stop being a mere storekeeper and begin to be a merchant. His store should be clean, it should be orderly, it should be attractive, it should win rather than repel trade.

The fact that the prices of the local merchant are regarded by the farmer as high, whether so or not so, is referred to in the third chapter, and in this connection the advantage of a bargain counter in the store is pointed out. The next chapter is devoted to what are termed "popular priced goods," those retailing from a dollar down, and this class of merchandise the retailer is urged to push with all the energy and enthusiasm possible.

The importance of handling a varied line is enforced in the fifth chapter, while the sixth refers especially to the convenient arrangement of the stock, by means of counters, shelving, &c. The plentiful use of price tickets is also commended.

Chapter the seventh treats interestingly of the show window, "leaders," special sales, &c. The succeeding chapter discusses buying, and following that the retailer's advertising is gone into at some length.

The tenth chapter is an appeal to the merchant to make his presence felt in the community and to cultivate close personal relations with his customers.

The closing chapters of this valuable booklet are devoted to the efficacy of distributing souvenirs and calendars and premium plans, to the desirability of going after holiday trade, to business method and system in the store and so on.

The following recapitulation of the contents of the booklet will be of interest as showing its tone and scope:

The solution of the problem of the general merchant is made difficult by conditions that were unknown a generation ago.

But rural free delivery, the telephone, city department stores, trolley lines and retail mail order competition are but instances of the operation of universal laws which no one can hope to evade.

And the merchant who is hurt by the operation of these general laws is not the one who does keep changing with the times.

Be a Real Merchant.

Stop being a storekeeper and start being a merchant. Begin with a thorough cleaning and rearranging—inside and out.

Make your store give fully as attractive an impression of orderliness as the retail mail order catalogues are studied to give.

The High Price Idea.

It is not your retail mail order competition that is so serious, but your customers' idea that your prices are higher than those of the retail mail order houses.

To prove that that idea is wrong, start some actual doing which could take no better first form than the start of a bargain counter. With that in operation you'll find opening up before you in all directions more and more ways of doing.

Dollar and Down Sales.

Keep a record of your sales by amounts long enough

to determine how much of your business is made up of sales of a dollar and down.

Also take the hint in the admissions made by retail mail order houses themselves—directly in their circulars discouraging small orders and indirectly by the fact that the factories they build or control are for the manufacture of the things whose size or cost, or both, make the expense for packing and shipping relatively small.

Then decide—uninfluenced by any outsider—just how much you yourself will profit from the sale of popular priced goods.

Variety.

Take particular note of the general preference for trading where merchandise is offered in the greatest variety.

Also realize that by handling many lines you can avoid dull seasons, turn your stock oftener, hold your trade better, increase your effectiveness in competing with retail mail order houses, &c.

Keep studying how to make your store arrangement and equipment more and more helpful in selling your goods.

Bargain Giving.

Realize that bargain giving is now the generally recognized basis of effective advertising, and that a bargain department in some form is perhaps the surest sign that the store is up to date.

Offer only genuine bargains—daring when necessary to make them that, to sacrifice profit, even to take a loss.

Rid yourself of stickers by displaying and redisplaying them with prices cut and recut until they do sell.

Keep Capital on the Move.

To achieve the greatest number of turns of investment, buy in small lots and often, by value and not by favor, through men or catalogue, free from costly prejudices for or against any merchandise or mode of marketing that merchandise.

Look upon every dollar of capital as a general might view every soldier in an army to be kept constantly on the move.

Advertising and Faith.

Believe in advertising your real bargains by printers' ink, special sales, show windows and every other legitimate means.

Prove your own faith in the values you advertise by the standing offer cheerfully to exchange goods or refund the money paid whenever a customer asks it.

Personal Relations.

Improve to the full your advantage in being able to deal with your trade in person. In all possible ways cultivate the personal relations of yourself, your clerks and your family with your customers.

Business Mastery.

Keep studying how to make your merchandising as distinctive as possible, and to that end avoid all prejudices in considering any plan that might help to strengthen your hold on your trade.

Become a modern merchant handling the goods his customers want—and when they want them—irrespective of his own opinion of those wares.

Devise and keep such simple records—by departments—as will help you to get to running your business in a spirit of "playing the game for all there is in it."

In pricing, remember that an average profit may be a danger as well as a convenience. Be as careful to price for profit on enough regular items as you are bold in forgetting profit on the few bargain items.

Make your merchandising appeal especially to women and children who buy most of the everyday wants.

Push for trade all the time. Discount bills. So far as possible also sell for cash. And in practical ways encourage cash buying all you can.

A Square Deal.

Get and keep a reputation for absolute squareness in every transaction, little and big. So treat clerks as to make sure of their interest in the store's success.

Mail Order Competition.

Regard the retail mail order problem as purely a personal one, which will remain unsolved only so long as and to the degree that personal effort to solve it is omitted.

Recognize that customers insist upon regarding retail mail order house competition as legitimate, make a virtue of the necessity, and proceed to acquire a thorough understanding of that competition preparatory to meeting it intelligently.

Take note of the tendencies developing a general scheme of trade, embracing manufacturer, jobber, retailer and retail mail order house, and in which each will play

a part of importance proportionate to the service he renders in accomplishing the greatest good to the greatest number.

Go With the Trend.

Realize fully the very important part the local retailer can play in that general scheme of trade, provided he acts with instead of against general tendencies, so much more powerful than any individual or class of individuals can be.

Recognize that, more and more, success in merchandising is to come through an increased volume of business done on a smaller margin, and that, more and more, it is to be won by merchants who spend money, time and effort to get business.

The booklet is also freely illustrated with views of attractive store interiors, diagrams and sketches of inexpensive racks, counters and other arrangements for accommodating and displaying goods.

THE PURE PAINT LAW OF NORTH DAKOTA.

Extracts from an address made by Prof. E. F. Ladd, State Dairy and Food Commissioner, at the recent annual convention of the North Dakota Retail Hardware Association.

One year or more has passed since the North Dakota Paint law must become operative, the enforcement of which was delayed for three months, owing to a temporary restraining order granted by the United States District Court to prevent the enforcement of the terms of the act. Sufficient time has, however, elapsed to show something of the value of this act for the protection of the people of the State when the same is properly enforced.

Public sentiment clearly indicates, in this State, that no act of the Legislature has been so popular; that no act of the Legislature has ever furnished more information of direct value to the people of the State and of more benefit in the way of protection to the consuming public than has come from the enforcement of the Paint law.

That this feeling and the need for such laws is not confined to North Dakota alone is clearly indicated from the fact that during the present winter there are before the Legislatures of several States, for consideration this summer in nature to that enacted in North Dakota. So far as I am aware, in each instance the bills have followed the lines of the North Dakota law. That the principles as enunciated in the North Dakota law have met the approval of the practical Paint men would be further indicated from the fact that the master painters throughout the country have generally indorsed this measure. The Master House Painters' and Decorators' Association of Pennsylvania has had drafted a bill following closely the lines of the North Dakota Paint law—namely, that those Paints not composed of the so-called statutory pigments must be labeled to show their composition.

A DIFFERENCE OF OPINION.

There has been a difference of opinion as to whether a law regulating the sale of Paints should require all Paints to be labeled, or only those which departed from the constituents which have long been recognized as the basis for Paint manufacture—namely, pure white lead, zinc oxide, pure turpentine, pure linseed oil, pure Japan drier and pure colors.

Many arguments have been put forth to show that a law exempting these Paints from labeling is unfair, but the evidences thus far presented have not been sufficient to convince me that it would be desirable to recommend any change at the present time in the wording of our law.

That other and so-called inert materials may be used as a substitute, and that they may be possessed of unusual merit need not be disputed, but until it has been demonstrated that they are equal to or superior as the basis for Paints, except in unusual cases, it does not seem wise to accept them on an equal basis with the foregoing named constituents.

CLIMATIC CONDITIONS,

as well as the character of the building material to which the Paint is to be applied, must to a considerable extent determine what is the best material to be used for Paint purposes. The use of a constituent which might be found wholly desirable along the seashore or in lighthouse buildings is not necessarily adapted to conditions inland, and the drier climate of North Dakota might possibly require modification in Paint manufacture as compared with more humid regions. Again, the character of the building material employed in this State differs from that of the more Eastern portion of our country.

THAT PAINT MANUFACTURERS ARE NOT WHOLLY AGREED among themselves as to what substitute is best to be

used is clearly indicated from the fact that one man believes silicates are the only proper material to be introduced as an inert constituent; others would use largely barytes; still others are using gypsum, or other forms of lime compounds, and there are some who it would seem have no preference. As the analysis of their Paints would seem to indicate, they have at times used the product most convenient at hand.

It is not unlikely true that each of these constituents, under certain conditions, may have a useful place, and that Paints may be used with satisfaction which are found to contain reasonable quantities of inert material, but to just what extent these are permissible, and under what conditions, has not yet been fully worked out, and until such time has come it is improper, it seems to the writer, to do other than to require that their presence be made known.

THE USE OF INERT MATERIALS.

In the past it has generally been maintained that the use of any of these inert materials with white lead or with white lead and zinc, was to be considered as adulterants, or, at best, were simply added for the purpose of reducing the cost, and perhaps it might as well be said of giving a greater profit to the manufacturer himself, without adding additional benefit to the consumer. That their introduction into the Paint has not resulted in reducing the cost to the consuming public may be clearly shown by a comparison of the selling price of many well-known Paints on the market.

PER CENT. INERT MATERIALS.

We have shown in our own investigations of Paints as found on the market that the substitution of these so-called inert materials has even been to the extent of 70 per cent. We have further pointed out that some of the Mixed Paints have been composed of 80 per cent. of zinc oxide, and 20 per cent. of white lead; others of 50 per cent. of white lead and 50 per cent. of zinc oxide. Surely all of these combinations cannot constitute equally efficient Paint materials for the conditions such as exist in North Dakota, even if the conditions here are materially different from those in other portions of our country.

When scientific investigations have been made that give us the desired information, then it will be time to permit the proper use of such materials as substitutes, or, if desirable or even as the basis of the Paints; and the public will then have become educated to understand the merits of these Paint materials; but with the policy which has been pursued by the majority of Paint manufacturers in the past of misleading and deceiving the public and, at times, of wilfully defrauding them, they must expect some reserve in accepting statements that come from interested parties.

It would seem to be, therefore, the duty of our experiment stations throughout the country to devote some time to investigations to determine the relative value of the various Paint constituents now generally employed.

WATER IN PAINTS.

Did the manufacturers of Paints discard the use of water in large quantities in the fluid portion of their Paints because of the exposures which were made under the North Dakota Paint law? If so, would they have continued to employ water had there been no law or chemical examinations made to inform the public to what extent water was used as a constituent in the fluid portion of the paints?

It cannot be said that the use of water in considerable quantity was confined wholly to the cheap Paints; some of the best and higher priced Paints upon the market have been found to contain varying quantities of water.

As yet no Paint manufacturer has put forth any legitimate excuse for the use of water in proportions greater than 2 per cent. It is claimed that a small amount has been used to keep the Paint in suspension.

Some of the manufacturers who have since left water out of their Paints did not do this so as to enable them to sell their Paints without labeling, since they are still labeling to show the constituents used in the manufacture of their Paints. It will thus be seen that the manufacturers employing such quantities of water knew that its use is illegitimate, that they were producing a fraud, that they were reaping a harvest out of proportion to the benefits which came to the user of such Paints, otherwise would have retained still their 18 to 24 per cent. of water in the Paints now produced.

Here, again, the people of North Dakota have been benefited by a knowledge of the composition of Paints, and by requiring that all Paints not made of statutory constituents shall be labeled to show their composition.

PHYSICAL PROPERTY OF THE PIGMENTS.

Of late a great deal has been said with regard to the importance of the physical character of the Paint as com-

pared with its chemical composition, that the physical character of the Paint is of more importance than are its chemical components. At this time I do not care to enter into a controversial discussion of this question, but it may be said in passing that the physical examination of the Paints has not been overlooked in our studies, and that in the course of time results will be given to the public which will be no less astounding in regard to the physical properties than are the results with regard to the chemical composition.

I have already pointed out the extent of the sandy Lead which is found in some samples examined, and our investigations have further shown that some of the Mixed Paints have never passed through a grinder in the process of preparation of the various pigments, but have simply been run through a mixer, and that these Paints were in such poor physical condition—the mixture so poorly made that the dry particles of pigments not wet with oil could be found in some of these cans.

Some of these Paints contained marble dust, and in some of the catalogue house Paints which have been examined the physical property of the pigments was not one whit better than can be procured from some clay bank, where the ingredients have been sifted to separate the coarse particles. It should not be thought for one moment, however, that we would have it understood that this applies to the best made Paints, but it is a further justification for the investigation of Paints, and for the pointing out to the public the physical character of the pigments employed in the preparation of some of these Paints.

HIGH GRADE MANUFACTURERS CONDEMN PRACTICE.

The producer of high grade Paints without regard to composition condemns such practice and in competition must meet this class of products, even though they are forced to lower their own standard below what their better judgment tells them is best. Some of these same Paint manufacturers have improved their Paint formulas because, as they say, North Dakota has offered them some protection. Likewise the producers of statutory Paints, so-called, have in several instances increased the proportion of white lead, cutting down the zinc, now that the public are informed regarding Paints and they are afforded due protection by law. Firms who have never before produced Lead Paint are now putting the same on the market. Would they do this had they not faith in the future demands, and would they have done this had there been no North Dakota Paint law?

SHORT WEIGHT.

In the case of a few Paints examined and reported upon it was found that they contained a larger volume than was claimed for them. In the larger number of cases, however, there is a shortage, although the shortage is not great; but there are several Paints where there is a shortage of 10 to 15 per cent. in volume. Now, when the volume is 10 to 15 per cent. short, when there is added water to take the place of oil and benzine to take the place of turpentine, and cheap, inexpensive material employed as pigments, is it any wonder that they are able to undersell the high grade Paints, and that the same have to a considerable extent displaced the so-called statutory pigments, or that the consuming public has found the use of such Paints to give unsatisfactory results, and that the buildings in many instances where such Paints have been used have been left in such bad shape that even good Paints fail to give satisfaction when applied over these old Paints?

CATALOGUE HOUSE PAINTS.

Other important work that was done as the result of the enactment of the Paint law in North Dakota was to show somewhat the character of the Paints sold by many of the catalogue houses. I need not go into detail with regard to these Paints, but it may be said that not one of them is what it is represented to be. They are made of the very same substances without even grinding.

We take, for example, —'s Paint, wherein the liquid portion was found to contain as high as 24 per cent. of water and the drier was benzine; where there was no true white lead present whatever, and calcium carbonate (largely in crystalline form as marble dust) was present, nearly to the extent of 42 per cent., and the barytes and silica constituted an additional 6.10 per cent.

Or to the sample as purchased from —, containing 18 per cent. of water, 175 per cent. of benzine in the liquid portion, and in their Colored Paints no white lead, but approximately 41 per cent. of lime carbonate and 7.66 per cent. of barium sulphate (barytes).

Take the Paint as purchased by us direct from —, the physical condition of which was the poorest of all Paints examined, the fluid portion of which was made up of 16.7 per cent. of water and 28.9 per cent. of benzine, while the pigments contained no white lead whatever,

but did contain 72.2 per cent. of inert white matter; largely calcium carbonate and barytes.

All of these Paints, together with those generally sold by the majority of department stores, show a similarity in composition, and in the majority of cases a similarity of physical properties, all of which indicate an exceedingly cheap Paint, and often when purchased at any price proves dear to the users of the same.

EXPOSURE TESTS.

Many of the Paint manufacturers have maintained that the only proper test is the actual exposure test. Such tests are being made by the Experiment Station, and already there has been constructed an exposure test wall, 75 ft. in length, upon the one side clapboarded and upon the opposite finished with the plain boards, on each side of which there are two types of lumber employed. Thus with each Paint a space 5 ft. square, duplicated upon the two sides, four tests are being made with the several types of Paint. These tests will be again repeated, and it may be said in passing that it is the intention to Paint a number of buildings with the various types of Paint in order to study their behavior in actual tests and in varying conditions such as are found in practice as well as in experimental work. We hope to carry on these experiments for at least 8 or 10 years, and thus be able to arrive at some definite conclusion with regard, not only to the wearing quality of the Paint, but as to how it behaves upon the different classes of building materials, and what kind of a surface is formed upon which to Paint; how such surfaces when repainted with various kinds of Paints will behave. In tests of this kind we must take into consideration a series of years, or practically the life of the average wooden structure, before we can definitely say what class of Paints would give the most satisfactory results under the conditions existing in North Dakota.

WILL RESULT IN GOOD.

No matter, then, what arguments may be made against the North Dakota law as a protective agent for the people, it has proven its right to exist. It has demonstrated the great fraud which has been perpetrated, not only in the sale of white lead, but, above all, in the sale of Mixed Paints. The investigations now under way regarding the character of the products which enter into the composition of Paints, such as ochre and the substitutes for white lead and zinc, and the various tinting materials, will permit of establishing standards for future guidance in judging of the chemical and physical properties of Paints. A careful study of the oils will likewise reveal much of value.

The exposure which has come from the analyses of Paints in North Dakota will ultimately result in good for every honest manufacturer; it will drive from the market many of the spurious products; it will educate the public to demand a better grade of Paint, and to expect better work on the part of the painter. The experimental data which will be secured should prove of immense benefit to Paint manufacturers, and we trust will enable the people to judge of the relative merits of those ingredients which are seeking a place for use in the preparation of Mixed Paints.

Paint laws similar to that of North Dakota will in the near future be passed by every State in the Union, and an honest attempt should be made to harmonize as far as possible the laws of the several States, and this could best be done by the enactment of a good national law, but an unfair compromise measure here would only lead to confusion and more drastic State laws.

A SUMMARY BASED ON INVESTIGATIONS.

As the result of our investigations upon Paints during the past year we feel justified in summarizing the following statements, which do not apply to the products of all Paint manufacturers, but to many of them, as set forth in our published reports:

1. That added water in Paints is always to be considered an adulterant.
2. That many Paints are falsely labeled; that claims are made which are intentionally false on the part of certain manufacturers, and that such false statements are repeated and emphasized in advertising literature and especially in the color cards which are distributed to the general public.
3. That the claims made by mail order houses with regard to Paints have, in every instance examined by this department, proven to be misleading and false, and that the Paints sent out by such houses are not what they are represented to be. That they are cheap, inferior in physical and chemical properties, and are not to be recommended.
4. That frequently where the labels upon the white Paint are correctly given it is found that the colors have an entirely different composition, but the public are not informed of this fact.
5. That in many Paints the dryers used are not what they are represented to be.
6. That the physical condition of a number of Paints examined was no less inferior than was the chemical condition in the same Paints.
7. A good paint should wear from the surface and so furnish a continuous protection coat for the building.
8. That Paints which peel or crack are to be condemned.
9. That so-called emulsion Paints are unfit for house paint.

ing where good and lasting work is required or when such buildings are to be painted.

10. Old Paint as found upon a building should furnish a good surface for repainting; otherwise that Paint previously used is to be classed as of inferior quality.

11. Paints which peel off or are drawn off from the wood when repainted are not desirable, and the fault may not lie with the Paint last used, but with the Paint preceding it, which failed to firmly adhere to the underlying wood.

12. That in some cases this condition is due to the use of improper priming coats.

13. That so far as examined but few, if any, of the Ochres are to be commended as desirable for use as a priming coat in house painting.

What I have here summarized is not to be understood as applying to all Paints, but clearly indicates the reason and necessity for Paint laws in protecting alike the consumer of Paint and the honest manufacturer as well.

AMONG THE HARDWARE TRADE.

Bunting-Stone Hardware Company, Kansas City, Mo., has increased its capital stock from \$50,000 to \$100,000. The company has made several additions to its line, and transacts a business largely wholesale in character.

Richmond Hardware Company, jobber and manufacturers' agent, of Richmond, Va., has just moved into larger quarters, which it has bought and fitted up in the most approved manner. The new store is conveniently situated, has convenient railroad service and is equipped with all up to date facilities for handling business with promptness and accuracy.

Kelly & Chaffee have succeeded to the Hardware business of Kelly & Hill, Ephrata, Wash.

Jolly Hardware Company has succeeded Jolly & Conrad, Milton, Iowa.

Waller & Rice, Smithville, Mo., have been succeeded in the Hardware business by Waller Williams & Son.

The business which has been conducted under the style of Phillips, Yarbrough & Allen at Opelika, Ala., has been incorporated as the Phillips-Yarbrough Hardware Company, with a paid in capital of \$30,000.

Adler, Vihstadt & Kruger are successors to the retail Hardware firm of Adler & Vihstadt, at Rochester, Minn. A new store, controlled by the same interests, will be opened on May 1 under the firm name of Adler & Vihstadt, at Red Wing, Minn., where a complete line of Hardware will be handled.

Lloyd's Handy Wagon Seat.

W. C. Heller & Co., Montpelier, Ohio, are offering the suspension wagon spring seat here illustrated. They recommend the device on the ground that it is light, handy,

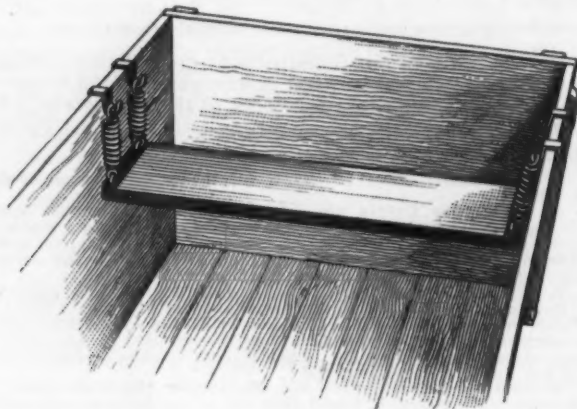


Fig. 1.—Lloyd's Handy Wagon Seat.

warm, easy riding, safe and durable. Its weight is only 15 lb. When loading a wagon it can be hung by the hooks outside the box out of the way, as shown in Fig.

2, but can be quickly and easily attached for use when wanted. Its warmth is attributed to the fact that it is a low down seat, bringing the driver down inside the wagon

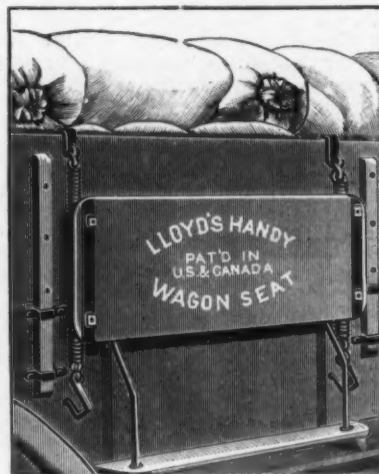


Fig. 2.—Wagon Seat Hung on Side of Loaded Wagon.

box, with his feet on the floor, where much of his body is protected from wind and storm.

General Electric Fan Motors for 1907.

In calling attention to its fan motors for the current year the General Electric Company, Schenectady, N. Y., refers especially to its new alternating current ceiling and column fans. Fig. 1 shows a combination ceiling fan and electroliter, and Fig. 2 a combination column fan and electroliter, especially designed for public dining tables, soda fountains, cafés, &c. Both styles of fans can, of course, be furnished without the lighting fixtures. They have four broad wooden blades 52 in. in diameter and will cool large areas, it is declared, without causing disagreeable drafts. They have two or three speeds. Smaller fans for direct current motors are also offered

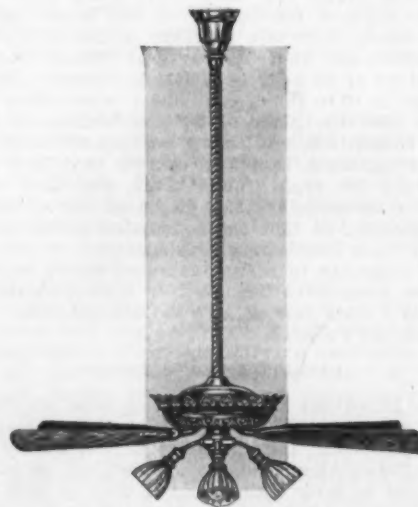


Fig. 1.—Alternating Current Ceiling Fan and Electroliter.

and are 56 and 58 in. in diameter. The 58-in. fans can be operated at three speeds and the 56-in. fan at a single speed. The motors are wound for all commercial voltages and frequencies. Special windings for operation on odd voltages and frequencies are furnished to order. Other fans offered by the company, which are not new this year, include desk and bracket fans for either direct or alternating current, exhaust fans for ventilating and telephone booth ventilating fans, the latter with spring suspension, which is said to eliminate vibration in the telephone booth, so that their operation does not interfere with hearing, but adds greatly to the comfort of

the occupant of the booth. Telephone booth fans are 8 in. in diameter for both alternating and direct current. The company states that the use of the fan motor in the cold air pipe of a hot air furnace has recently been tried and found to be an economical addition to this heating system. The square frames of the exhaust fan types are recommended for this purpose and can be installed permanently. In a general way it is stated that the stand-

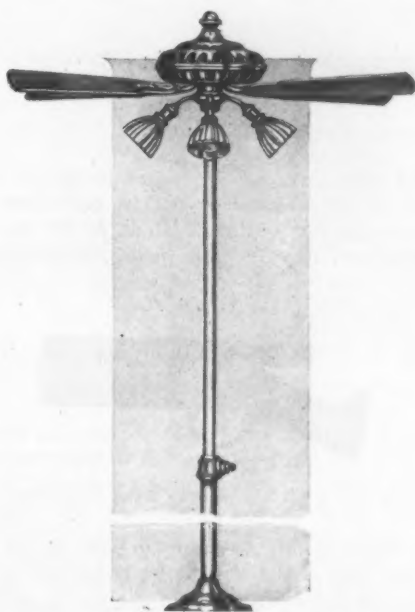


Fig. 2.—Alternating Current Column Fan and Electroliner.

ard finish for General Electric fan motors is black, with brass trimmings, but this may be varied to meet special conditions, and fans can be decorated to match office fittings or to harmonize with the hardware in private houses.

Corrugated Steel Fastener with Saw Tooth Edge.

The corrugated steel fasteners shown in the accompanying cuts are made by the Acme Flexible Clasp Company, Chicago. The fastener with the sharpened saw tooth edge is an improved form, which has been devised

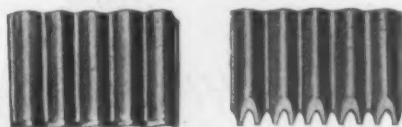


Fig. 1.—Plain and Saw Tooth Edge Corrugated Fasteners.

to increase the usefulness and adaptability of this sort of device for holding two pieces of wood together. The company states that the use of a fastener with a plain sharpened edge was somewhat limited, owing to the fact

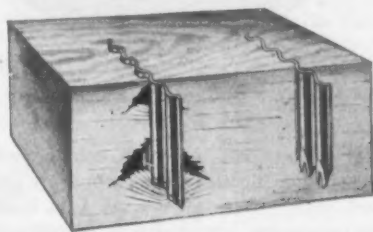


Fig. 2.—Comparative View of Plain and Saw Tooth Fasteners Entering Wood.

that it could be driven into but few kinds of wood. It has a tendency to crowd and break down the fibers, especially in soft wood, while the new fastener enters with a shearing cut, so that it can be driven cleanly through almost any kind of wood, as shown in the comparative illustration, Fig. 2. The fastener is made with either

divergent or parallel corrugations, as desired, and is furnished in various sizes suitable for all kinds of wood joining work. As already explained, the smooth edge form of fastener is still made by the company, although it is believed that it will be largely superseded by the saw tooth edge on account of the advantages referred to.

Morss Jam Planking Clamp

The A. S. Morss Company, Boston, Mass., is the maker of the device illustrated herewith, for forcing one plank against another in planking a boat. The clamp is shown



Fig. 1.—Morss Jam Planking Clamp.

separately in Fig. 1 and in operation in Fig. 2. It is made of tough cast iron, enameled. When the clamp is placed on the frame, as shown in Fig. 2, it jams so that it will not slip up and thus makes a backing for a wooden

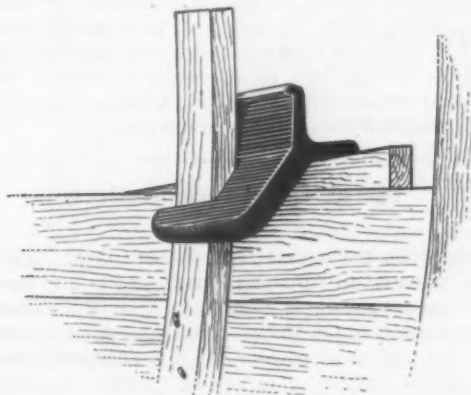


Fig. 2.—Morss Planking Clamp in Operation.

wedge. As the wedge is driven in it forces the plank down against the one below it, thus making a tight seam. Clamps are furnished in six sizes, the frame molded ranging from 1 to 1 1/2 in.

Twin Wrist Hook and Protector Corn Husker.

The accompanying illustrations show two corn husking appliances manufactured by R. N. Thomas, Shenandoah, Iowa, maker of a complete line of husking gloves and tools. Fig. 1 represents the twin wrist hook, which is



Fig. 1.—Twin Wrist Hook.

said to be especially effective for speedy work in husking. It is composed of a wide leather wristlet, to which is riveted a steel plate with pointed hooks punched from the solid metal, and raised by a right angle bend to project above the plate, with points extending inward and

parallel to its surface. It is attached to the wrist, fitting close up to the heel of the hand, leaving the fingers free to complete the operation after the husks, by a raking motion, are torn apart by the hooks. This appliance is

and lock work made of spring steel. It is $38\frac{1}{2}$ in. long over all, and has a 20-in. barrel. The stock and fore end are made of polished Louisiana walnut, which gives lightness and proper balance. Rocky Mountain step rear



Fig. 1.—H. & A. Military Style Repeating Rifle.

said to enable the user to work rapidly and effectively. Fig. 2 represents a different style, known as the Protector, which in addition to the wrist band has a leather piece extending upward and covering the lower part of the

sights and pinhead front sights are furnished. Twenty-two short or 22 long, or long rifle cartridges may be used, the magazine holding 16 short or 12 long, or long rifle cartridges, and feeding them promiscuously. To



Fig. 2.—Protector Corn Husker.

palm. This is attached to a curved steel plate carrying a single hook formed in the same manner as above described, except that the hook carries a deep corrugation to give it sufficient stiffness to prevent bending. Several variations of the two styles herewith shown, together with steel reinforced gloves and husking pegs of novel design, complete the manufacturer's line.



Fig. 2.—H. & A. Repeating Rifle, Bolt Action.

load the rifle it is only necessary to pull out the tube and insert cartridges in the slot, bullet point out; it operates by raising the lever to the top of the barrel, pulling back the bolt till the shell is thrown out and then pushing the bolt back into place and returning the lever to the first position.

Pneumatic League and Junior League Baseballs.

The Goodyear Tire & Rubber Company, Akron, Ohio, represented by Lee & Underhill, 35 Warren street, New York, has followed the introduction of the silk pneumatic golf ball last season with the pneumatic league baseball, illustrated in Figs. 1 and 2. Fig. 1 shows the general appearance of the ball, smaller than actual size. Fig. 2 is a sectional view, illustrating the various walls and

Metal Gas Check Bullets.

Ideal Mfg. Company, New Haven, Conn., announces that it is ready to furnish reloading tools and molds for its new metal gas check bullets, as here illustrated. Bullet No. 358,315 is for the 35 caliber Remington automatic rifle. The charge of powder for this rifle with this bullet is 28 grains weight of lightning. Bullet No. 311,316 is



No. 311316.

No. 358315.

Metal Gas Check Bullets.

for the 32/20 high velocity rifle, and the proper charge of powder is 10 grains of sharpshooter. As the shells for above rifles may be used over and over again, the economy of reloading is obvious, and the operation of the arms and the accuracy of this ammunition is said to be equal, if not superior, to the factory ammunition. It is also asserted that these bullets do not wear the barrels, as do the hard metal covered bullets.

Military Style Repeating Rifle.

Hopkins & Allen Arms Company, Norwich, Conn., has recently added to its line of firearms a 22 caliber military style repeating rifle shown in the accompanying illustrations. Fig. 1 represents the stock and barrel of the arm, and Fig. 2 the bolt action. The rifle has safety device, improved quick twist rifling, drop forged parts



Fig. 1.—Pneumatic League Base Ball.

cover. The center is filled with compressed air at an intense pressure, accurately determined by gauge to meet league conditions. The inner wall A is a gelatine composition to retain the air, which is introduced through a small hollow needle, according to gauge, the withdrawal of needle causing the gelatine to close permanently the slight puncture. Outside the gelatine is jacket B to reinforce it, followed by a close thread winding and then covered in the familiar way with best horsehide, tanned especially for the company and hand sewed by expert men. The compressed air is introduced before the ball is waterproofed and covered. The manufacturers emphasize the point that while a hard rap, that permanently

flattens an old style ball to an appreciable extent, flattens a pneumatic as well, the great inner pressure instantly restores the spherical shape and causes the ball to fly true. The constant outward pressure evenly and equally in every direction, from the center out, holds the ball



Fig. 2.—Sectional View of Ball.

sound and round. The league ball is of regulation size, circumference 9 in., and weight 5 oz., and lists at \$1.25 each. There is also a pneumatic junior baseball, circumference 8½ in., weight 4½ oz., made exactly like the standard league ball, listing 75 cents each. The balls are handsomely put up, being first wrapped in white tissue paper, then in tin foil, and packed in a sealed pasteboard box, which may be preserved, in which to return the ball for recovering at the factory, if desired, at a charge of 40 cents for either, which includes return postage paid by the company.

Enameled Chafing Dish Pan with Removable Rim.

S. Sternau & Co., Brooklyn, N. Y., is offering an improvement in its line of chafing dishes in the shape of a white enameled food pan with removable metal rim, as shown in the accompanying cut. When placed inside the chafing dish the pan appears to be entirely of metal, as only the rim and handle are seen. The advantage of this type of pan is said to be that it can always be kept perfectly clean, eliminating any possible accumulation of food between an enameled pan and a stationary rim. Further-

more, when the enameled pan becomes chipped or worn it is a simple matter to supply a new one, while the rim, being removable, need not be replaced. Removable rims



Chafing Dish Pan with Removable Rim.

are furnished in silver plate, copper or nickel plate, and can be used on any of the manufacturers' 3-pint chafing dishes.

Oil Pump.



Oil Pump.

The Ideal Pump Company, Sabina, Ohio, is offering the pump shown in the accompanying cut, which is especially designed for pumping oil. The company states that there is no fluid too heavy for this pump to handle. It is made of 1½-in. galvanized iron and operates by means of a folding suck, the same as the cistern pump made by the company, but takes in the liquid from the bottom instead of from the side or through a T-shaped end, as do the cistern and baller pumps. It is stated that there is nothing about the construction of the pump to wear out, and that it may be expected to last for a long time. Lengths regularly furnished are from 3 to 10 ft.

Richmond Hardware Company, Richmond, Va., has just moved into new quarters made up of two separate buildings of four and five floors, respectively, and containing about 50,000 sq. ft. of space, which is more than double that of its old location. The new establishment has trackage facilities by which goods can be moved in and out conveniently and expeditiously.

PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils—

Animal, Fish and Vegetable Oils—	gal
Linseed, City, raw.....	42 @43
City, Boiled.....	43 @44
State and Western, raw.....	40 @41
Raw Calcutta, in bbls.....	70 @71
Lard, Extra Prime, Winter.....	73 @74
Extra No. 1.....	51 @52
No. 1.....	45 @46
Cotton-seed, Crude, f.o.b. mills.....	40 @41
Summer Yellow, Prime.....	47 @48
Summer White.....	51 @52
Yellow Winter.....	51 @52
Sperm, Crude.....	50 @51
Natural Winter.....	72 @73
Bleached Winter.....	75 @76
Bleached Winter, Extra.....	76 @77
Tallow, Prime.....	61 @62
Whale, Crude.....	35 @36
Natural Winter.....	46 @47
Bleached Winter.....	48 @49
Extra Bleached Winter.....	51 @52
Menhaden, Brown, Strained.....	32 @33
Light Strained.....	32 @33
Northern.....	32 @33
Southern.....	32 @33
Cocaoaut, Ceylon.....	10 @11
Cochin.....	10 @11
Cod, Domestic, Prime.....	37 @38
Newfoundland.....	40 @41
Red, Elaine.....	47 @48
Saponified.....	67 @68
Olive, Italian, bbls., Yellow.....	85 @86
Neatsfoot, Prime.....	56 @57
Palm, Logos.....	7 @7

Mineral Oils—

Black, 29 gravity, 25@30 cold test.....	114 @115
29 gravity, 15 cold test.....	124 @125
Summer.....	114 @115
Cylinder, light filtered.....	114 @115
Dark, filtered.....	114 @115
Paraffine, 90-97 gravity.....	14 @15
93 gravity.....	13 @14
93 gravity.....	10 @11
Red.....	13 @14

Miscellaneous—

Barytes:	
White, Foreign.....	18.50 @20.50
Amer. floated.....	19.00 @20.00
Off color.....	18.00 @19.00
Chalk, in bulk.....	3.00 @3.25
In bbls.....	100 @100
China Clay, Imported.....	11.00 @17.50
Cobalt, Oxide.....	100 @2.50
Whiting, Commercial.....	100 @.43
Gilders.....	100 @.55
Ex. Gilders.....	100 @.60
Putty, Commercial.....	100 @1.70
In bladders.....	1.70 @1.85
In bbls. or tubs.....	1.20 @1.45
In 1 lb to 5 lb cans.....	2.65 @2.85
In 12½ to 50 lb cans.....	1.50 @1.90
Spirits Turpentine.....	100 @74
In Oil bbls.....	74 @75
In machine bbls.....	78 @79
Glue—	
Cabinet.....	12 @15
Common Bone.....	7 @9
Extra White.....	18 @24
Foot Stock, White.....	12 @14
Foot Stock, Brown.....	9 @11
German Hide.....	12 @18
French.....	10 @40
Irish.....	13 @16
Low Grade.....	10 @12
Medium White.....	14 @17
Gum Shellac—	
Bleached Commercial.....	46 @48
Bones, Dried.....	58 @60
Button.....	40 @50
Diamond I.....	59 @60
Fine Orange.....	52 @57
A. C. Garnet.....	46 @47
Kala Button.....	35 @36
D. C.....	62 @63
Octagon B.....	64 @65
T. N.....	47 @48
V. S. O.....	59 @60
Colors in Oil—	
Black, Lampblack.....	12 @14
Blue, Chinese.....	36 @46
Blue, Prussian.....	32 @38

Blue, Ultramarine.....	13 @16
Brown, Vandyke.....	11 @14
Green, Chrome.....	12 @16
Green, Paris.....	12 @16
Sienna, Raw.....	12 @15
Sienna, Burnt.....	12 @15
Umber, Raw.....	11 @14
Umber, Burnt.....	11 @14
White Lead, Zinc, &c.—	
Lead, English white, in Oil.....	9 @10
Lead, American White:	
Lots of 500 lb or over, in Oil.....	7 @7
Lots less than 500 lb, in Oil.....	8 @8
Lead, White, in oil, 25 lb tin.....	1 @1
Lead, White, in oil, 12½ lb tin.....	1 @1
Lead, White, in oil, 1 to 5 lb.....	1 @1
Lead, American, Terms: For lots 12 tons and over ¼¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.....	5 @5
Zinc, American, dry.....	5 @5
Zinc, French:	
Antwerp, Red Seal, dry.....	10 @10
Paris, Red Seal, dry.....	9 @9
Paris, Green Seal, dry.....	11 @11
Zinc, V. M. French, in Poppy Oil:	
Green Seal:	
Lots of 1 ton and over.....	134 @134
Lots of less than 1 ton.....	134 @134
Zinc, V. M. French, in Poppy Oil:	
Red Seal:	
Lots of 1 ton and over.....	114 @114
Lots of less than 1 ton.....	124 @124
Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%: 25 bbls., 2%: 50 bbls., 4%.....	
Dry Colors—	
Black, Carbon.....	6 @10
Black Drop, American.....	4 @6
Black Drop, English.....	5 @13

Black, Ivory.....	16 @20
Lamp, Com.....	4 @6
Blue, Celestial.....	4 @6
Blue, Chinese.....	30 @33
Blue, Prussian.....	28 @32
Blue, Ultramarine.....	4 @15
Brown, Spanish.....	1 @1
Carmin, No. 40.....	3.10 @3.25
Green, Chrome, ordinary.....	3 @7
Green, Chrome, pure.....	17 @25
Lead, Red, bbls., ½ bbls., kegs.....	7 @7
Litharge, bbls., ½ bbls., kegs.....	7 @7
Ocher, American.....	10 @16.00
American Golden.....	24 @34
French.....	14 @2
Foreign Golden.....	3 @4
Orange Mineral, English.....	10 @12
French.....	10 @12
German.....	8 @10
American.....	8 @9
Red, Indian, English.....	4 @6
American.....	3 @34
Red, Turkey, English.....	4 @10
Red, Tuscan, English.....	7 @10
Red, Venetian, Amer.....	100 @50.50
English.....	100 @11.15
Sienna, Italian, Burnt and Powdered.....	3 @94
Italian, Raw, Powdered.....	3 @7
American, Raw.....	14 @2
American Burnt and Pow'd.....	14 @2
Talc, French.....	39 ton 15.00 @25.00
American.....	39 ton 15.00 @25.00
Terra Alba, French.....	100 @1.00
English.....	100 @1.00
American.....	100 @1.00
American.....	100 @1.00
Umber, Tkey, Bnt. & Pow'd.....	24 @34
Turkey, Raw and Powdered.....	24 @34
Burnt, American.....	14 @2
Raw, American.....	14 @2
Yellow Chrome.....	13 @15
Vermilion, American Lead.....	10 @25
Quicksilver, bulk.....	5 @6
Quicksilver, bags.....	5 @6
English, Imported.....	5 @6
Chinese.....	5 @6

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33% @ 33% & 10% signifies

that the price of the goods in question ranges from 33% per cent. discount to 33% and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1906, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—

Domestic, $\frac{1}{2}$ doz. \$3.00.....33%
North's.....10%
Zimmerman's—See Fasteners, Blind.
Window Stop
Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition—See Caps, Cartridges, Shells, &c.

Anti-Rattlers—

Fernald Mfg. Co. Burton Anti-Rattlers, $\frac{1}{2}$ doz. pairs, Nos. 1, \$0.75; 2, \$0.60; 4, \$1.00; 5, \$0.50.
Fernald Quick Shifter, $\frac{1}{2}$ doz. pairs.....\$2.00@3.00

Anvils—American—

Eagle Anvils..... $\frac{1}{2}$ lb. @ 8%
Hay-Budden, Wrought.....9%
Trenton..... $\frac{1}{2}$ lb. 9%
Imported—

Peter Wright & Sons, $\frac{1}{2}$ lb. 84 to 340 lb. 11¢; 350 to 600 lb. 11%
Anvil, Vise and Drill—

Millers Falls Co., \$18.00.....15%
Apple Parers—See Parers, Apple, &c.

Aprons, Blacksmiths'—
Livingston Nail Co.....33%

Augers and Bits—

Com. Double Spur.....70¢@10¢
Jennings' Patn., reg. finish.....60¢@60¢
Black Lip or Blued.....65¢@65¢
Boring Mach. Augers.....70¢
Car Bits, 12-in. twist.....40¢
Ford's Auger and Car Bits.....40¢
Ft. Washington Auger Co., Concord's.....35%
Forstner Pat. Auger Bits.....25%
O. E. Jennings & Co.:
No. 19 ext. lip, R. Jennings' list.....25%
No. 20, R. Jennings' list.....40¢
Russell Jennings.....25¢@25¢
L'Hommedieu Car Bits.....15¢
Pugh's Black.....30¢
Pugh's Jennings' Pattern.....30¢
Snell's Auger Bits.....60¢
Snell's Bell Hangers' Bits.....60¢
Snell's Car Bits, 12-in. twist.....60¢
Snell's King Auger Bits.....50¢
Wright's Jennings' Bits.....50¢

Bit Stock Drills—
See Drills, Twist.

Expansive Bits—
Clark's, small, 418; large, 438.....50¢@10¢
Clark's Pattern, No. 1, $\frac{1}{2}$ doz. \$20;
No. 2, \$18.....60¢@10¢
Ford's, Clark's Pattern.....60¢
C. E. Jennings & Co., Steer's Pat. 25¢
Lavigne Pat., small size, \$18.00; large size, \$36.00.....60¢@10¢
Swan's.....60¢

Gimlet Bits— Per gro.
Common Dble. Cut.....\$3.00@3.25
German Pattern, Nos. 1 to 10,
\$4.75; 11 to 13, \$5.75

Hollow Augers—
Bonney Pat., per doz. \$5.50@6.00
Ames.....25¢@10¢
Universal.....20¢
Wood's Universal.....20¢

Ship Augers and Bits—
Ford's.....40¢@10¢
C. E. Jennings & Co.:
L'Hommedieu's.....15%
Watrous'.....33%
Snell's.....40%

Awl Hafts—See Handles, Mechanics' Tool.

Awls—
Brad Awls:
Handled.....gro. \$2.75@3.00
Unhanded, Shl'dered.....gro. \$3.00@3.25
Unhanded, Patent.....gro. \$3.00@3.25
Peg Awls:
Unhanded, Patent, gro. \$1.34@1.40
Unhanded, Shl'dered.....gro. \$1.50@1.60
Scratch Awls:
Handled, Com.....gro. \$3.50@4.00
Handled, Socket, gro. \$11.00@12.00

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—
Single Bit, base weights: Per doz.
First Quality.....\$1.75@5.00
Second Quality.....\$1.25@4.50
Double Bit, base weights:
First Quality.....\$7.00@7.50
Second Quality.....\$6.50@7.75

Axle Grease—

See Grease, Axle

Axles—

Iron or Steel

Concord, Loose Collar.....45¢@5¢
Concord, Solid Collar.....45¢@5¢
No. 1 Common, Loose.....35¢@4¢
No. 2 Solid Collar.....35¢@4¢
Half Patent.....35¢@4¢
Nos. 7, 8, 11 and 12.....70¢@75¢
Nos. 13 to 14.....70¢@75¢
Nos. 15 to 18.....75¢@75¢
Nos. 19 to 22.....75¢@75¢

Boxes, Axle—
Common and Concord, not turned
lb., 4½¢@5¢
Common and Concord, turned,
lb., 5½¢@6¢
Half Patent.....lb., 9½¢@10¢

Bait— Fishing—

Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20¢@5¢

Balances— Sash—

Caldwell new list.....50%
Fullman.....50¢@10¢@60%

Spring—

Spring Balances.....50¢@10¢@60%

Chatillon's:
Light Spg. Balances.....50¢@50¢@10¢
Straight Balances.....40¢@40¢@10¢
Circular Balances.....50¢@10¢
Large Dial.....30%

Barb Wire—See Wire, Barb.

Bars— Crow—

Steel Crowbars, 10 to 40 lb. per lb., 3¢@3½¢

Towel—

No. 10 Ideal, Nickel Plate.....gro. \$8.50

Beams, Scale—

Scale Beams.....40%
Chatillon's No. 1.....30%
Chatillon's No. 2.....40%

Beaters, Carpet—

Holt-Lyon Co.:
No. 12 Wire Coppered $\frac{1}{2}$ doz. \$0.80;
Tinned.....\$0.85
No. 11 Wire Coppered $\frac{1}{2}$ doz. \$1.15;
Tinned.....\$1.20
No. 10 Wire Tinned..... $\frac{1}{2}$ doz. \$1.50
Western W. G. Co.:
No. 1 Electric.....gro. \$7.80
No. 2 Buffalo.....gro. \$9.00
No. 3 Perfection Dusk.....gro. \$8.00

Egg—

Holt-Lyon Co.:
Holt, per doz., No. 5, Jap'd, \$0.80;
No. A, Jap'd, \$1.15; No. B, Jap'd,
\$1.85; No. 6, Jap'd, \$1.65.
Lyon, Jap'd, per doz., No. 2,
\$1.35.
Taplin Mfg. Co.:
Improved Dover, per gro. No. 60,
\$4.00; No. 75, \$4.50; No. 100, \$7.00;
No. 102, Tin'd, \$8.50; No. 150,
Hotel, \$15.00; No. 152, Hotel
Tin'd, \$17.00; No. 200, Tumbler,
\$8.50; No. 202, Tumbler Tin'd,
\$9.50; No. 300, Mammoth, per
doz., \$25.00.
Turner & Seymour Mfg. Co.:
T. & S. Dover.....\$6.00
Western, W. G. Co., $\frac{1}{2}$ gro., Buffalo,
No. 2, \$8.00; Perfection, No. 3,
\$9.00.
Wonder (R. M. Co.)..... $\frac{1}{2}$ gro. net, \$6.25

Bellows—

Blacksmith, Standard List.....65%
Split Leather.....65%
Grain Leather.....60%

Hand—

Inch.....6 7 8 9 10
Doz.....\$3.50 6.15 6.60 7.15 7.70

Molders—

Inch.....9 10 11 12 14
Doz.....\$8.00 9.00 10.50 12.50 14.50

Bells— Cow—

Ordinary Goods.....75¢@75¢@10¢
High grade.....70¢@10¢@75¢
Jersey.....75¢@10¢
Texas Star.....50%

Door—

Abbe's Gong.....40¢@40¢@10¢
Barton Gong.....50%
Home R. & E. Mfg. Co.'s.....55¢@10¢
Trip Gong.....50¢@50¢@10¢
Yankee Gong.....40¢@10¢@50%

Hand—

Polished, Brass.....50¢@50¢@10¢
White Metal.....50¢@50¢@10¢
Nickel Plated.....40¢@10¢@50%

Sucia.....50¢@10¢@50¢@10¢@5¢
Cone's Globe Hand Bells.....33%
Silver Chime.....33%
Miscellaneous—
Farm Bells.....lb., 2½¢@2½¢
Church and School.....60%
Table Call Bells.....50¢@50¢@10¢

Belting— Leather—

Extra Heavy, Short Lap.....60¢@5¢
Regular Short Lap.....60¢@10¢@5¢
Standard.....70%
Light Standard.....70¢@5¢
Cut Leather Lacing.....45%
Leather Lacing Sides, per sq. ft. 85¢

Rubber—

Agricultural (Low Grade).....75¢@5¢
Common Standard.....70¢@70¢@10¢
Standard.....60¢@60¢@10¢
Extra.....60¢@60¢@5¢
High Grade.....50¢@50¢@10¢

Bench Stops—

See Stops, Bench

Benders and Upsetters, Tire—

Detroit Perfected Tire Bender.....40%
Detroit Stoddard's Lightning Tire
Upsetters, No. 1, \$4.25; No. 2, \$7.25;
No. 3, \$10.50; No. 4, \$14.25; No. 5,
\$28.50.
Green River Tire Benders and Up-
setters.....50%

Bicycle Goods—

John S. Leng's Son & Co.'s 1907 list:
Chain, Parts, Spokes.....50%
Tubes.....60%

Bits—

Auger, Gimlet, Bit Stock Drills,
&c.—See Augers and Bits.

Blocks— Tackle—

Common Wooden.....75%
Harris St. Tackle Blocks.....50¢@50¢@5¢
B. & L. B. Co.:
Boston Wood Snatch, 50%; Eclipse
Steel, 75%; Hollow Steel, 50¢@10¢;
Star Wire Rope, 50%; Tarbox Metal
Snatch, 50%; Tarbox New Style
Steel, 50¢@10¢; Wire Rope Snatch,
50%.
Lau's Patent Automatic Lock and
Junior.....30%
Stowell's Novelty, Mal. Iron.....50%
Stowell's Loading.....50¢@10¢
See also Machines, Hoisting.

Boards, Stove—

Zinc, Crystal, &c.....40%
Paper, Lincd, Embossed.....50¢@10¢

Boards, Wash—

See Washboards.

Bobs, Plumb—

Keuffel & Esser Co.....33%
Bolts—
Carriage, Machine, &c.—
Common Carriage (cut thread):
% x 6 and smaller 70¢@12%
Larger and Longer 60¢@2½¢
Phila. Eagle \$3.00 list May 21, '99

Bolt Ends.....65¢@65¢@5¢
Machine, $\frac{1}{2}$ x 4 and smaller.....70¢@12%
Machine, larger and longer.....60¢@12%
Door and Shutter—
Cast Iron Barrel, Japanned,
Round Brass Knch:
Inch.....3 4 5 6 8
Per doz.....\$1.30 25 45 60 80
Cast Iron Spring Foot, Jap'd:
Inch.....6 8 10
Per doz.....\$1.20 1.50 2.25
Cast Iron Chain, Flat, Japanned:
Inch.....6 8 10
Per doz.....\$1.00 1.40 1.65
Cast Iron Flat Shutter, Jap'd,
Brass Knobs:
Inch.....6 8 10
Per doz.....\$0.75 25 1.25
Wrought Barrel Jap'd, 80¢@80¢@10¢
Barrel Bronzed.....60¢@10¢
Spring.....70¢@10¢@70¢@10¢
Shutter.....50¢@50¢@10¢@5¢
Square Neck.....75¢@75¢@10¢
Square.....70¢@10¢@10¢
Ives' Patent Door.....50%

Plow and Stove—

Plow.....65¢@10¢@—%
Stove.....85¢@85¢@10%

Tire—

Common Iron.....80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84.....80%
Eagle Phila., list Oct. 16, '84.....82%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84.....80%
Eagle Phila., list Oct. 16, '84.....82%
Eclipse, list Dec. 28, '99.....80%
Mount Carmel Bolt Co.:
Norway Phila., list Oct. 16, '84.....80%
Eagle Phila., list Oct. 16, '84.....82%
Mount Carmel, list Dec. 28, '99.....80%
Russell, Burdall & Ward Bolt &
Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct. 16, '84.....80%
Shelton Co.:
Tiger Brand, list Dec. 28, '99.....80%
Phila., Eagle, list Oct. 16, 1884.....82%
Upson Nut Co.:
Tire Bolts.....72%
Borers, Tap—
Borers Tap, Ring, with Handle:
Inch.....1¼ 1½ 1¾ 2
Per doz.....\$1.50 6.60 6.40 8.00
Inch.....2 2½ 3 3½
Per doz.....\$5.65 11.50
Enterprise Mfg. Co., No. 1, \$1.25; No. 2,
\$1.75; No. 3, \$2.50 each.....25%

Boxes, Brite—

C. E. Jennings & Co.....30%
Langdon, New Langdon and Lang-
don Improved, 30¢@10¢; Langdon
Acme.....15¢@10¢
Perfection.....40%
Seavey.....40%
Stanley B. & L. Co., No. 240 to
460, 30%; No. 50 and 60.....35%

Braces—

Common Ball, American, \$1.25@1.30
Barber's.....50¢@10¢@10¢
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, \$1 to 125, 30¢ to
\$44
C. E. Jennings & Co.....50¢
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat.....50%
Millers Falls Drill Braces.....25¢@10¢
P. S. & W. Co., Peck's Pat. 60¢@60¢@5¢
Stanley B. & L. Co.:
Stanley, 35%; Victor.....45%

Brackets—

Wrought Steel.....70¢@10¢@75¢@10¢
Griffin's Pressed Steel.....75¢@10¢@80%
Griffin's Folding Brackets.....70¢@10¢
Stowell's Cast Steel, 75%; Sink.....50%
Western, W. G. Co., Wire.....60¢@10¢

Bright Wire Goods—

See Wire and Wire Goods.

Broilers—

Kilbourne Mfg. Co.....75¢@20%
Western, W. G. Co.....80%
Wire Goods Co.....75¢@10¢

Buckets, Galvanized—

Mfg'r's list, price per gross.
Quart.....10 12 14
Water, Reg.....25.35 28.00 32.00
Water, Hvy.....45.35 48.00 52.00
Fire, Rd. Btm.....32.00 34.65 38.65
Well.....37.35 41.35 45.35

Bucks, Saw—

Hosier..... $\frac{1}{2}$ gro. \$36.00

Bull Rings—See Rings, Bull

Butts— Brass—

Wrought, High List, Oct. 26, '06,
45¢@45¢@10%
Cast Brass, Tiebout's.....40%

Cast Iron—

Fast Joint, Broad.....40¢@10¢@50%
Fast Joint, Narrow.....40¢@10¢@50%
Loose Joint.....70¢@10¢@75%
Loose Pin.....70¢@10¢@75%
Mayer's Hinges.....70¢@70¢
Parliament Butts.....70¢@70¢
Wrought Steel—
Discount
Reversible and Broad.....70¢@5%
Light Reversible, Light Nar-
row.....70¢@5%
Loose Joint, Narrow, Light
Inside Blind, etc.....70%
Rock Flaps, Table Chest.....65%

Cages, Bird—

Hendryx, Brass: Series 3000, 5000,
1100, 1200, 25%; 300, 350, 600,
900.....60%

Extractors, Lemon Juice

—See Squeezers, Lemon.
Fasteners, Blind—

Zimmerman's 50¢ to 10¢
Wallings 40¢ to 10¢

Cord and Weight—

Ives 33 1/2%

Faucets—

Cork Lined 50¢ to 10¢
Metallic Key, Leather Lined 60¢ to 10¢ to 70¢

Red Cedar 70¢ to 10¢ to 75¢
Petroleum 70¢ to 10¢ to 75¢

R. & L. B. Co. 60¢ to 10¢
Star 50¢ to 10¢

West Lock 50¢ to 10¢
John Sommer's Peerless Tin Key 40¢

John Sommer's Boss Tin Key 50¢
John Sommer's Victor M. Key 50¢ to 10¢

John Sommer's Duplex Metal Key 60¢
John Sommer's Diamond Lock 40¢

John Sommer's I. X. L. Cork Lined 50¢
John Sommer's Reliable Cork Lined 50¢

John Sommer's Chicago Cork Lined 60¢
John Sommer's G. K. Cork Lined 50¢

John Sommer's No Brand, Cedar 50¢
John Sommer's Perfection, Cedar 40¢

McKenna, Brass 20¢
Burglar Proof, N. P. 20¢

Improved, 3/4 and 1 inch 20¢
Self Measuring: 20¢

Enterprise, 3/4 doz. \$36.00 40¢ to 10¢
Lane's, 3/4 doz. \$36.00 40¢ to 10¢

National Measuring, 3/4 doz. \$36.40 to 10¢

Felloe Plates—

See Plates, Felloe.

Files— Domestic—

List Nov. 1, 1899.
Best Brands 70¢ to 10¢ to 75¢ to 10¢

Standard Brands 75¢ to 10¢ to 75¢ to 10¢ to 10¢
Lower Grade 75¢ to 10¢ to 75¢ to 10¢ to 10¢

Imported—

Stubs' Tapers, Stubs' Net, July 24, '97 35 1/2 to 40%

Fixtures, Fire Door—

Richards Mfg. Co.:
Universal, No. 103; Special, No. 104 3.75

Fusible Links, No. 96 50¢
Expansion Bolts, No. 107 60¢ to 10¢

Grindstone—

Net Prices:
Inch 15 17 19 21

Per doz. \$3.25 3.75 4.25 4.75
P. S. & W. Co. 30¢ to 10¢

Reading Hardware Co. 60¢
Stowell's Giant Grindstone Hanger, 3/4 doz. \$6.00

Stowell's Grindstone Fixtures, Extra Heavy, 40¢ to 10¢; Light 50%

Fodder Squeezers—

See Compressors.

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Ezy Potato 60¢ to 10¢
Victor, Hay 80¢ to 15¢ to 2 1/2%

Victor, Manure 60¢
Victor, Header 65¢

Champion, Hay 65¢
Champion, Header 65¢

Champion, Manure 60¢ to 15¢ to 2 1/2%
Columbia, Hay 60¢ to 20¢

Columbia, Manure 70¢
Columbia, Spading 70¢ to 12 1/2%

Hawkeye Wood Barley 40¢
W. & C. Potato Digger 60¢ to 10¢

Acme Hay 60¢ to 20¢
Acme Manure, 4 tine 60¢ to 10¢ to 5¢

Dakota Header 60¢ to 20¢
Jackson Steel Barley 60¢ to 20¢

Kansas Header 65¢
W. & C. Favorite Wood Barley 40%

Plated.—See Spoons.

Frames— Saw—

White, 8' 9" Bar, per doz. 75¢ to 80¢
Red, 8' 9" Bar, per doz. 1.00 to 1.15

Red, Dbl. Brace, per doz. 1.40 to 1.50

Freezers, Ice Cream—

Qt. 1 2 3 4 5 6

Each \$1.30 \$1.60 \$1.90 \$2.20 \$2.50 \$2.80

Fruit and Jelly Presses—

See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.**Fuse—**

Per 1000 Feet.
Hemp \$2.75

Cotton 3.20
Waterproof Sgl. Taped 3.65

Waterproof Dbl. Taped 4.40
Waterproof Tpl. Taped 5.15

Gates, Molasses and Oil—

Stebbins' Pattern 80¢ to 10¢

Gauges—

Marking, Mortise, &c. 50¢ to 10¢
Chapin-Stephens Co.:
Marking, Mortise, &c. 50¢ to 10¢

Diston's Marking, Mortise, &c. 67 1/2%
Stanley R. & L. Co.'s Butt and Rabbit Gauge 35%

Marking and Mortise 35%
Wire, Brown & Sharpe's 33 1/2%
Wire, Morse's 30%

Gimlets— Single Cut—

Numbered assortments, per gro. 22.50

Nail, Metal, No. 1, 22.00; 2, 22.50
Spike, Metal, No. 1, 21.00; 2, 21.50

Nail, Wood Handled, No. 1, 22.50; 2, 22.00
Spike, Wood Handled, No. 1, 21.50; 2, 21.00

Glass, American Window

See Trade Report.

Glasses, Level—

Chapin-Stephens Co. 65¢ to 65¢ to 10%

Glue, Liquid Fish—

Bottles or Cans, with Brush 25¢ to 10¢ to 50%

International Glue Co. (Martin's) 40%

Grease, Axle—

Common Grade gro. \$4.50 to 6.00

Dixon's Everlasting, 10-lb pails, ea. 85¢; in boxes, 3 doz., 1 lb. \$1.20; 2 lb. 2.00

Helmet Hard Oil 25%

Griddles, Soapstone—

Pike Mfg. Co. 33% to 33% to 10%

Grindstones—

Pike Mfg. Co.:
Improved Family Grindstones, 3/4 inch, 3/4 doz., \$2.00 33%

Royal Mfg. Co.:
Alumund Grinding Machines, each, Nos. 01, \$1.75; 1A, \$2.50; 10, \$5.00 30%

Alumund Sickle Grinders, each, Nos. 20A, \$4.00; 20A Combined, \$4.50 30%

Alumund Disc Grinders, each, \$2.50 30%

Grips, Nipple—

Perfect Nipple Grips 40¢ to 10¢ to 3%

Halters and Ties—

Cow Ties 40¢ to 10¢ to 60¢ to 10%

Covert Mfg. Co.:
Web 30¢ to 2%

Jute Rope 35%
Sisal Rope 20%

Cotton Rope 45%
Hemp Rope 45%

Oneida Community:
Am. Coil and Halters 40¢ to 40¢ to 5%

Am. Cow Ties 45¢ to 50¢
Niagara Coil and Halters 45¢ to 50¢ to 5%

Niagara Cow Ties 45¢ to 50¢ to 10¢ to 5%

Hammers—**Handled Hammers—**

Heller's Machinists' 55¢ to 10¢ to 55¢ to 10¢ to 5%

Heller's Farmers' 40¢ to 50¢ to 40¢ to 5%

Magnetic Tack, Nos. 1, 2, 3, \$1.25, \$1.50, \$1.75 50%

Peck, Stow & Wilcox, Steel 50%

Payette R. Plumb:
A. E. Nail 40¢ to 2 1/2% to 40¢ to 12 1/2%

Eng. and B. S. Hand 60¢ to 12 1/2% to 60%

Machinists' Hammers 50¢ to 15¢ to 60¢ to 5%

Rivet and Timbers 40¢ to 2 1/2% to 40¢ to 12 1/2%

Heavy Hammers and Sledges—

Under 3 lb., per lb., 50¢, 80¢ to 50¢

3 to 5 lb., per lb., 40¢, 80¢ to 50¢

Over 5 lb., per lb., 30¢

Wilkinson's Smiths' lb. 9 1/2 to 10 1/2

Handles—**Agricultural Tool Handles**

Axe, Pick, &c. 60¢ to 10¢ to 60¢ to 10¢ to 5%

Hoe, Rake, &c. 40¢ to 15¢ to 5%

Fork, Shovel, Spade, &c. 40¢ to 15¢ to 5%

Long Handles 40¢ to 15¢ to 5%

D Handles 40%

Cross-Cut Saw Handles—

Atkins' 40%

Champion 50%

Diston's 50%

Mechanics' Tool Handles—

Auger, assorted gro. \$3.50 to \$3.00

Brad Axl. gro. \$1.65 to \$1.75

Chisel Handles, Ass'd, per gro.:
Tanged Firmer, Apple, \$2.40 to \$2.55; Hickory \$2.15 to \$2.40

Socket Firming, Apple, \$1.75 to \$1.95; Hickory \$1.15 to \$1.60

Socket Framing, Hickory, \$1.60 to \$1.75

File, assorted gro. \$1.30 to \$1.40

Hammer, Hatchet, &c. 60¢ to 10¢ to 60¢ to 10¢ to 5%

Hand Saw, Varnished, doz. 80¢ to 85¢; Not Varnished 65¢ to 75%

Plane Handles:
Jack, doz. 30¢; Jack, Bolted, 75¢

Fore, doz. 45¢; Fore, Bolted, 90¢

Chapin-Stephens Co.:
Carving Tool 40¢ to 40¢ to 10%

Chisel 65¢ to 65¢ to 10%

File and Awl 65¢ to 65¢ to 10%

Saw and Plane 40¢ to 40¢ to 10%

Screw Driver 40¢ to 40¢ to 10%

Millers Falls Adj. and Ratchet Auger 20¢ to 10%

Nicholson Simplicity File Handle 3/4 gro. \$0.85 to \$1.50

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.

Allith Mfg. Co.:
Reliable, No. 1; Allith, No. 3; Allith Adjustable, No. 6; Reliable Parlor Door 50%

Chicago Spring Butt Co.:
Friction 25%

Oscillating 25%

Big Twin 25%

Chisholm & Moore Mfg. Co.:
Baggage Car Door 50%

Elevator 30%

Railroad 50%

Cronk & Carrier Mfg. Co.:
Roller Bearing 60¢ to 10%

Roller Bearing 70%

Griffin Mfg. Co.:
Solid Axle, No. 10, \$12.00 70%

Roller Bearing, No. 11, \$15.00 70%

Roller Bearing, Ex. Hy., No. 22, \$18.00 70%

Hinged Hangers, \$16.00 60¢ to 10%

Lane Bros. Co.:
Parlor, Ball Bearing, \$1.00; Standard, \$3.15; No. 105, \$2.85; New Model, \$2.80; New Cham-

ber Door, Standard 60¢ to 2%

Hinged net \$6.08

Covered 60¢ to 2%

Special 70¢ to 5%

Lawrence Bros.:
Advance and Sterling 60¢ to 2 1/2%

Cleveland and Peerless 70¢ to 5%

Clipper, No. 75 60¢ to 5%

Crown 60¢ to 2 1/2%

Cyclone-Tandem net \$7.50

Easy Parlor Door, Dbl. Sets, \$2.50; Single Sets, \$1.25 60%

Giant 70¢ to 5%

Hummer 70¢ to 5%

New Cyclone, Flexible, \$16.00 60¢ to 2 1/2%

New York 60¢ to 2 1/2%

McKinney Mfg. Co.:
No. 1, Special, \$15 60¢ to 10%

No. 2, Standard, \$18 60¢ to 10%

Hinged Hangers, \$16 60¢ to 5%

Meyers Stoyan Hangers 60¢ to 5%

Richards Mfg. Co.:
Hangers, Nos. 47, 48, 117, 217, 60¢ to 5%

Pioneer Wood Track, No. 3, \$2.25

Roller B'r'g St'l Track No. 12, \$2.20

Roller B'r'g St'l Track No. 13, \$2.50

Roller B'r'g, Nos. 39, 70¢ to 7 1/2%

Hero, Adj. Track No. 19, 50¢ to 10%

Adjustable Track Tandem Trolley Track No. 16 50¢ to 10%

Seal, Steel Track No. 8 \$2.25

Auto Adj. Track No. 22 50¢ to 5%

Trolley B. D. No. 17, \$1.25; No. 18, \$1.40; No. 19, \$2.25; No. 121, \$2.45; No. 150 \$2.50

Safety Underwriters F. D. No. 101 50%

Tandem No. 44, 2 1/2% and 3 60¢ to 10%

P. Place, Adjustable Track No. 132 50¢ to 5%

Royal, Adjustable Track No. 122 50¢ to 10%

Ives' Wood Track No. 1 50¢ to 10%

Trolley B. D. No. 20, \$1.50; No. 21, \$1.40; No. 24, \$1.30; No. 27, \$1.40; No. 28 \$1.60

Roller Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2, 70¢ to 7 1/2%

Anti-friction, No. 42; No. 44, sizes 2 1/2 and 3, 60¢ to 5%

Hinged Tandem No. 48 60¢ to 5%

Folding Door B. B. Swivel No. 135 40%

Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing 30%

Alax Hinge Door 60%

Atlas Parlor Door 50¢ to 10%

Baggage Car Door 50%

Climax Anti-Friction 50%

Elevator 40%

Express 50%

Landy Parlor Door 50%

Matchless 70%

Nansen 70%

Parlor Door, 50¢ to 10%; Railroad, 50¢ to 10%

Steel, No. 300, 404, 500 50%

Underwriters' Fire Door 40%

Wild West Warehouse Door, 50%

Wilburn, No. 6, net, 3/4 doz. \$9.00

Zenith for Wood Track 50%

A. L. Sweet Iron Works:
Check Back, 70

Hitchers, Stall—
Covert Mfg. Co., Stall Hitchers. 30&2%

Hods—Coal—
M'f'gr's list, price per gross.
Inch 15 16 17 18
Galv. Open. \$35 \$39 \$42 \$46
Jap. Open. 26 28 31 35
Galv. Funnel. 43 48 52 56
Jap. Funnel. 33 36 39 43

Masons' Etc.—
Cleveland Wire Spring Co.:
Steel Brick, No. 162.....each \$1.05
Steel Mortar, No. 158.....each \$1.35

Hoes—Eye—
Scovill and Oval Pattern.....
60&100&60&10&10%

Grub, list Feb. 23, 1899.....
70&100&75&10%

D. & H. Scovill.....30%

Handled—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Weeding, No. 1, \$2.75; No. 2, \$2.50
Star Double Bit.....\$3.20

St. Madison Cotton Hoe.....70&100&10%
St. Madison Crescent Cultivator Hoe.....70&100&10%

St. Madison Mattock Hoes.....70&100&10%
Regular Weight.....\$ doz. 66%
Junior Size.....\$ doz. \$4.00

St. Madison Sprouting Hoe.....\$ doz. 50%
St. Madison Dixie Tobacco Hoe.....70&100&10%

Kretzinger's Cut Easy.....70&100&10%
Warren Hoe.....45&10%

W. & C. Ivanhoe.....75&22%
B. B. 6 in. Cultivator Hoe.....\$3.15

B. B. 6 1/2 in.\$3.35
Acme Weeding.....\$ doz. net, \$4.35

W. & C. L. tuing Shufble Hoe.....\$ doz. \$4.85

Hoisting Apparatus—
See Machines, Hoisting.

Holders—Bit—
Angular, \$ doz. \$24.00.....45&10%

Door—
Bardsley's, Iron, 40%; Brass and Bronze.....33%
Empire.....50%
Pullman.....35%
Superior.....33%

File and Tool—
Nicholson File Holders and File Handles.....33%&10%

Fruit Jar—
Triumph Fruit Jar Holder, \$ gross, \$10.80; \$ doz.\$1.25

Trace and Rein—
Fernald Double Trace Holder, \$ doz. pairs.....\$1.25

Dash Rein Holder, \$ doz. pairs.....\$1.25

Hones—Razor—
Pike Mfg. Co., Belgian, German and Swaty.....50%

Hooks—Cast Iron—
Bird Cage, Reading.....40%
Clothes Line, Reading List.....40%
Clothes Line, Stowell's.....70%
Coat and Hat, Reading.....45&20%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....65%
Harness, Reading List.....40%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—
Belt.....80%
Wire C. & H. Hooks.....75&75&10%

Columbian Hdw. Co., Gem.....70&5%
Parker Wire Goods Co., King.....70&10%
Western W. G. Co., Molding.....75%

Wire Goods Co.:
Acme, 60&10%; Chief, 70%; Crown, 75%;
Czar, 65%; V. Brace, 75%;
Czar Harness, 50&10%.

Wrought Iron—
Box, 6 in., per doz., \$1.00; 8 in., \$1.25; 10 in., \$1.50.

Cotton.....\$ doz. \$1.05&\$1.25
Wrought Staples, Hooks, &c.—
See Wrought Goods

Miscellaneous—
Hooks, Bench, see Staps, Bench.
Bush, Light, doz. \$4.75; Medium, \$5.35; Heavy, \$6.25

Grass, best, all sizes, per doz. \$1.60
Grass, common grades, all sizes, per doz.\$1.39

Whiffletree.....lb. 5%&4¢
Hooks and Eyes—
Brass.....60&5&60&10&5%
Malleable Iron.....70&70&10%

Covert Mfg. Co. Gate and Scuttle Hooks.....40%
St. Madison Cut-Easy Corn Hooks, \$ doz. \$3.25 net

Turner & Stanton Co. Cup and Shoulder.....30&10&10%
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—
See Nails, Horse.

Horseshoes—
See Shoes, Horses.

Hose, Rubber—
Garden Hose, 3/4-inch:

Competition.....ft. 5 @ 6¢
3-ply Guaranteed.....ft. 8 @ 9¢
4-ply Guaranteed.....ft. 10 @ 11¢

Cotton Garden, 3/4-in., coupled.....Low Grade.....ft. 8 @ 9¢
Fair Quality.....ft. 10 @ 11¢

Irons—Sad—
From \$ to 10.....lb. 3 @ \$3.4¢
R. B. Sad Irons.....lb. 3/4 @ \$3.4¢

Mrs. Potts', cents per set:
Nos. 50 55 60 65
Jap'd Tops.....80 77 90 88
Tind's Tops.....85 95 98

New England Pressing, lb. 3/4 @ \$4¢
Pinking—
Pinking Irons.....\$ doz. 6¢

Irons, Soldering
See Copiers.**Jacks, Wagon—**

Covert Mfg. Co.:
Auto Screw.....30&2%; Steel, 45%
Lockport.....50%
Lane's Steel.....30&10&2%
Richards' Tiger Steel, No. 130.....50&10%
Smith & Hemenway Co.'s.....25%

Kettles—

Brass, Spun, Plain.....20&25%
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—
Foster Bros' Butcher, &c.....30%
Wilkinson Shear & Cutlery Co.....60%

Corn—

Wilkinson Shear & Cutlery Co.:
Wileut Brand Knives and Hooks, 60%
Wilmington Acme, \$ doz. \$2.65;
Dent, \$2.75; Adj. Serrated, \$2.20;
Serrated, \$2.10; Yankee No. 1, \$1.50;
Yankee No. 2, \$1.15.

Drawing—

Standard List.....75&5&75&10%
C. E. Jennings & Co., Nos. 45, 46, 60%
Jennings & Griffin, Nos. 41, 42.....75%
Swan's.....66&70%
Watrous.....16%
L. & J. White.....20&5&25%

Hay and Straw—

Serrated Edge, per doz. \$5.50 @ 5.75
Iwan's Sickle Edge.....\$ doz. \$9.50
Iwan's Serrated.....\$ doz. \$10.00

Mincing—

Buffalo.....\$ gro. \$13.00

Miscellaneous—

Farriers'.....\$ doz. \$3.00 @ 3.25
Wostenholm's.....\$ doz. \$3.00 @ 3.25

Knobs—

Base, 2 1/2-inch, Birch, or Maple,
Rubber Tip.....gro. \$1.25 @ \$1.40

Carriage, Jap., all sizes.....gro. 40 @ 45¢

Door, Mineral.....\$ doz. 65 @ 70¢

Door, Por. Jap'd.....\$ doz. 70 @ 75¢

Door, Por. Nickel, \$ doz. \$2.05 @ 2.15

Bardsley's Wood Door, Shutters, &c. 15%

Lacing, Leather—

See Belting, Leather.

Ladders, Store, &c.—

Allith Mfg. Co., Reliable.....50%
Lane's Store.....25%
Myers' Noiseless Store Ladders.....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....50%
Climax Shelf, No. 113.....50%
Trolley, No. 109.....50%

Ladies, Melting—

L. & G. Mfg. Co. (low list).....25%
P. S. & W.....40&10%
Reading.....60%

Lanterns—Tubular—

Regular Tubular, No. 0.....\$ doz. \$4.25 @ 4.50

Lift Tubular, No. 0.....\$ doz. \$4.75 @ 5.00

Hinge Tubular, No. 0.....\$ doz. \$4.75 @ 5.00

Other Styles.....\$ doz. \$4.00 @ 4.50

Bull's Eye Police—

No. 1, 2 1/2-inch.....\$2.75 @ 3.00
No. 2, 3-inch.....\$3.00 @ 3.25

Lasts and Stands, Shoe—

Stowell's Atlas, Malleable Iron.....50%
Stowell's Badger, Cast Iron.....50%

Latches—Thumb—

Roggin's Latches, with screws.....\$ doz. 35 @ 40¢

Door—

Allith Mfg. Co., Automatic, No. 400, \$ doz.\$4.00

Cronk & Carrier Mfg. Co., No. 101, \$ doz. \$2.30

Cronk & Carrier Mfg. Co., Latch, Hasp and Staples.....50%
Richards' Bull Dog, Heavy, No. 125.....50&5%
Richards' Trump, No. 127.....\$1.50

Stowell's Steel.....50%

Leaders, Cattle—

Small.....\$ doz. 50¢; large, 60¢
Covert Mfg. Co.:
Cotton, 45%; Hemp, 45%; Jute, 35%;
Sisal, 20%.

Lifters, Transom—

R. & E.....10%

Lines—

Wire Clothes, Nos. 18 19 20
100 feet.....\$2.25 2.00 1.75
75 feet.....\$1.75 1.55 1.10

Amnston Waterproof Clothes, 50 ft. Air Line, \$23.00; Acme, \$18.00; Alabama, \$17.00; Empire, \$16.00; Advance, \$14.00; Eclipse, \$13.50; Chicago, \$11.50; Standard, \$10.50; Columbia, \$9.50; Allston, \$8.50; Calhoun, \$12.30.

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3, 40%
Solid Braided Masons'.....30%
Silver Lake Braided Chalk, No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50; No. 4, \$8.00; No. 5, \$8.50; No. 6, \$9.00; No. 7, \$9.50; No. 8, \$10.00; No. 9, \$10.50; No. 10, \$11.00; No. 11, \$11.50; No. 12, \$12.00; No. 13, \$12.50; No. 14, \$13.00; No. 15, \$13.50; No. 16, \$14.00; No. 17, \$14.50; No. 18, \$15.00; No. 19, \$15.50; No. 20, \$16.00; No. 21, \$16.50; No. 22, \$17.00; No. 23, \$17.50; No. 24, \$18.00; No. 25, \$18.50; No. 26, \$19.00; No. 27, \$19.50; No. 28, \$20.00; No. 29, \$20.50; No. 30, \$21.00; No. 31, \$21.50; No. 32, \$22.00; No. 33, \$22.50; No. 34, \$23.00; No. 35, \$23.50; No. 36, \$24.00; No. 37, \$24.50; No. 38, \$25.00; No. 39, \$25.50; No. 40, \$26.00; No. 41, \$26.50; No. 42, \$27.00; No. 43, \$27.50; No. 44, \$28.00; No. 45, \$28.50; No. 46, \$29.00; No. 47, \$29.50; No. 48, \$30.00; No. 49, \$30.50; No. 50, \$31.00; No. 51, \$31.50; No. 52, \$32.00; No. 53, \$32.50; No. 54, \$33.00; No. 55, \$33.50; No. 56, \$34.00; No. 57, \$34.50; No. 58, \$35.00; No. 59, \$35.50; No. 60, \$36.00; No. 61, \$36.50; No. 62, \$37.00; No. 63, \$37.50; No. 64, \$38.00; No. 65, \$38.50; No. 66, \$39.00; No. 67, \$39.50; No. 68, \$40.00; No. 69, \$40.50; No. 70, \$41.00; No. 71, \$41.50; No. 72, \$42.00; No. 73, \$42.50; No. 74, \$43.00; No. 75, \$43.50; No. 76, \$44.00; No. 77, \$44.50; No. 78, \$45.00; No. 79, \$45.50; No. 80, \$46.00; No. 81, \$46.50; No. 82, \$47.00; No. 83, \$47.50; No. 84, \$48.00; No. 85, \$48.50; No. 86, \$49.00; No. 87, \$49.50; No. 88, \$50.00; No. 89, \$50.50; No. 90, \$51.00; No. 91, \$51.50; No. 92, \$52.00; No. 93, \$52.50; No. 94, \$53.00; No. 95, \$53.50; No. 96, \$54.00; No. 97, \$54.50; No. 98, \$55.00; No. 99, \$55.50; No. 100, \$56.00; No. 101, \$56.50; No. 102, \$57.00; No. 103, \$57.50; No. 104, \$58.00; No. 105, \$58.50; No. 106, \$59.00; No. 107, \$59.50; No. 108, \$60.00; No. 109, \$60.50; No. 110, \$61.00; No. 111, \$61.50; No. 112, \$62.00; No. 113, \$62.50; No. 114, \$63.00; No. 115, \$63.50; No. 116, \$64.00; No. 117, \$64.50; No. 118, \$65.00; No. 119, \$65.50; No. 120, \$66.00; No. 121, \$66.50; No. 122, \$67.00; No. 123, \$67.50; No. 124, \$68.00; No. 125, \$68.50; No. 126, \$69.00; No. 127, \$69.50; No. 128, \$70.00; No. 129, \$70.50; No. 130, \$71.00; No. 131, \$71.50; No. 132, \$72.00; No. 133, \$72.50; No. 134, \$73.00; No. 135, \$73.50; No. 136, \$74.00; No. 137, \$74.50; No. 138, \$75.00; No. 139, \$75.50; No. 140, \$76.00; No. 141, \$76.50; No. 142, \$77.00; No. 143, \$77.50; No. 144, \$78.00; No. 145, \$78.50; No. 146, \$79.00; No. 147, \$79.50; No. 148, \$80.00; No. 149, \$80.50; No. 150, \$81.00; No. 151, \$81.50; No. 152, \$82.00; No. 153, \$82.50; No. 154, \$83.00; No. 155, \$83.50; No. 156, \$84.00; No. 157, \$84.50; No. 158, \$85.00; No. 159, \$85.50; No. 160, \$86.00; No. 161, \$86.50; No. 162, \$87.00; No. 163, \$87.50; No. 164, \$88.00; No. 165, \$88.50; No. 166, \$89.00; No. 167, \$89.50; No. 168, \$90.00; No. 169, \$90.50; No. 170, \$91.00; No. 171, \$91.50; No. 172, \$92.00; No. 173, \$92.50; No. 174, \$93.00; No. 175, \$93.50; No. 176, \$94.00; No. 177, \$94.50; No. 178, \$95.00; No. 179, \$95.50; No. 180, \$96.00; No. 181, \$96.50; No. 182, \$97.00; No. 183, \$97.50; No. 184, \$98.00; No. 185, \$98.50; No. 186, \$99.00; No. 187, \$99.50; No. 188, \$100.00; No. 189, \$100.50; No. 190, \$101.00; No. 191, \$101.50; No. 192, \$102.00; No. 193, \$102.50; No. 194, \$103.00; No. 195, \$103.50; No. 196, \$104.00; No. 197, \$104.50; No. 198, \$105.00; No. 199, \$105.50; No. 200, \$106.00; No. 201, \$106.50; No. 202, \$107.00; No. 203, \$107.50; No. 204, \$108.00; No. 205, \$108.50; No. 206, \$109.00; No. 207, \$109.50; No. 208, \$110.00; No. 209, \$110.50; No. 210, \$111.00; No. 211, \$111.50; No. 212, \$112.00; No. 213, \$112.50; No. 214, \$113.00; No. 215, \$113.50; No. 216, \$114.00; No. 217, \$114.50; No. 218, \$115.00; No. 219, \$115.50; No. 220, \$116.00; No. 221, \$116.50; No. 222, \$117.00; No. 223, \$117.50; No. 224, \$118.00; No. 225, \$118.50; No. 226, \$119.00; No. 227, \$119.50; No. 228, \$120.00; No. 229, \$120.50; No. 230, \$121.00; No. 231, \$121.50; No. 232, \$122.00; No. 233, \$122.50; No. 234, \$123.00; No. 235, \$123.50; No. 236, \$124.00; No. 237, \$124.50; No. 238, \$125.00; No. 239, \$125.50; No. 240, \$126.00; No. 241, \$126.50; No. 242, \$127.00; No. 243, \$127.50; No. 244, \$128.00; No. 245, \$128.50; No. 246, \$129.00; No. 247, \$129.50; No. 248, \$130.00; No. 249, \$130.50; No. 250, \$131.00; No. 251, \$131.50; No. 252, \$132.00; No. 253, \$132.50; No. 254, \$133.00; No. 255, \$133.50; No. 256, \$134.00; No. 257, \$134.50; No. 258, \$135.00; No. 259, \$135.50; No. 260, \$136.00; No. 261, \$136.50; No. 262, \$137.00; No. 263, \$137.50; No. 264, \$138.00; No. 265, \$138.50; No. 266, \$139.00; No. 267, \$139.50; No. 268, \$140.00; No. 269, \$140.50; No. 270, \$141.00; No. 271, \$141.50; No. 272, \$142.00; No. 273, \$142.50; No. 274, \$143.00; No. 275, \$143.50; No. 276, \$144.00; No. 277, \$144.50; No. 278, \$145.00; No. 279, \$145.50; No. 280, \$146.00; No. 281, \$146.50; No. 282, \$147.00; No. 283, \$147.50; No. 284, \$148.00; No. 285, \$148.50; No. 286, \$149.00; No. 287, \$149.50; No. 288, \$150.00; No. 289, \$150.50; No. 290, \$151.00; No. 291, \$151.50; No. 292, \$152.00; No. 293, \$152.50; No. 294, \$153.00; No. 295, \$153.50; No. 296, \$154.00; No. 297, \$154.50; No. 298, \$155.00; No. 299, \$155.50; No. 300, \$156.00; No. 301, \$156.50; No. 302, \$157.00; No. 303, \$157.50; No. 304, \$158.00; No. 305, \$158.50; No. 306, \$159.00; No. 307, \$159.50; No. 308, \$160.00; No. 309, \$160.50; No. 310, \$161.00; No. 311, \$161.50; No. 312, \$162.00; No. 313, \$162.50; No. 314, \$163.00; No. 315, \$163.50; No. 316, \$164.00; No. 317, \$164.50; No. 318, \$165.00; No. 319, \$165.50; No. 320, \$166.00; No. 321, \$166.50; No. 322, \$167.00; No. 323, \$167.50; No. 324, \$168.00; No. 325, \$168.50; No. 326, \$169.00; No. 327, \$169.50; No. 328, \$170.00; No. 329, \$170.50; No. 330, \$171.00; No. 331, \$171.50; No. 332, \$172.00; No. 333, \$172.50; No. 334, \$173.00; No. 335, \$173.50; No. 336, \$174.00; No. 337, \$174.50; No. 338, \$175.00; No. 339, \$175.50; No. 340, \$176.00; No. 341, \$176.50; No. 342, \$177.00; No. 343, \$177.50; No. 344, \$178.00; No. 345, \$178.50; No. 346, \$179.00; No. 347, \$179.50; No. 348, \$180.00; No. 349, \$180.50; No. 350, \$181.00; No. 351, \$181.50; No. 352, \$182.00; No. 353, \$182.50; No. 354, \$183.00; No. 355, \$183.50; No. 356, \$184.00; No. 357, \$184.50; No. 358, \$185.00; No. 359, \$185.50; No. 360, \$186.00; No. 361, \$186.50; No. 362, \$187.00; No. 363, \$187.50; No. 364, \$188.00; No. 365, \$188.50; No. 366, \$189.00; No. 367, \$189.50; No. 368, \$190.00; No. 369, \$190.50; No. 370, \$191.00; No. 371, \$191.50; No. 372, \$192.00; No. 373, \$192.50; No. 374, \$193.00; No. 375, \$193.50; No. 376, \$194.00; No. 377, \$194.50; No. 378, \$195.00; No. 379, \$195.50; No. 380, \$196.00; No. 381, \$196.50; No. 382, \$197.00; No. 383, \$197.50; No. 384, \$198.00; No. 385, \$198.50; No. 386, \$199.00; No. 387, \$199.50; No. 388, \$200.00; No. 389, \$200.50; No. 390, \$201.00; No. 391, \$201.50; No. 392, \$202.00; No. 393, \$202.50; No. 394, \$203.00; No. 395, \$203.50; No. 39

Potato—
Baratona 50 doz. \$7.50
White Mountain 50 doz. \$6.00

Picks and Mattocks—
List, Feb. 23, 1899 70¢/10¢/75¢
Cronk's Handled Garden Mattock,
50 doz., No. 2, \$2.60; No. 3, \$4.40.

Pinking Irons—
See Irons, Pinking.

Pins, Escutcheon—
Brass 50¢/10¢/60¢
Iron, list Nov. 11, '85 60¢/60¢/10¢

Pipe, Cast Iron Soil—
Carload lots.
Standard, 2-6 in. 50¢/10¢/50¢/10¢/5¢
Extra Heavy, 2-6 in. 65¢/10¢
Fittings 70¢/10¢/70¢/10¢/5¢

Pipe, Merchant—
Consumers, Carload.
Steel. Iron.
Blk. Galv. Blk. Galv.
1/2 & 1/4 in. 60 50 59¢/5 43¢/5
3/4 in. 68 54 61¢/5 43¢/5
1 in. 70 58 63¢/5 43¢/5
1 1/4 in. 74 64 68¢/5 43¢/5
1 1/2 in. 74 64 68¢/5 43¢/5
7 to 12 in. 69 54 63¢/5 43¢/5

Pipe, Vitrified Sewer—
Carload lots.
Standard Pipe and Fittings, 3
to 24 in., f.o.b. factory:
First-class 84¢
Second-class 87¢
NOTE—Market irregular.

Pipe, Stove—
Per 100 joints.
Edwards' Nested: C. L. L. C. L.
6 in., Standard Blue \$6.25 \$7.25
6 in., Standard Blue 7.75 7.75
7 in., Standard Blue 7.75 8.75
5 in., Royal Blue 7.00 8.00
6 in., Royal Blue 7.50 8.50
7 in., Royal Blue 8.50 9.50

Planes and Plane Irons—
Wood Planes—
Bench, first qual. 30¢/30¢/10¢
Bench, second qual. 40¢/40¢/10¢
Molding 25¢/25¢/10¢
Bailey's (Stanley R. & L. Co.) 35¢/25¢
Chapin-Stephens Co.:
Bench, First Quality 30¢
Bench, Second Quality 40¢
Molding and Miscellaneous 25¢
Toy and German 30¢
Union 60¢

Iron Planes—
Bailey's (Stanley R. & L. Co.) 35¢
Chapin's Iron Planes 50¢/40¢
Miscellaneous Planes (Stanley R. & L. Co.) 30¢/25¢
Union 60¢

Plane Irons—
Wood Bench Plane Irons, list
Dec. 12, '06 25¢

Planters, Corn, Hand—
Kohler's Eclipse 50 doz. \$8.00

Plates—
Felloe 10¢/4¢/4¢
Self-Sealing Pie Plates (H. M. Co.) 50¢
@ \$1.30; 6 in., \$1.45 @ \$1.50.

Pliers and Nippers—
Button Pliers 75¢/75¢/10¢
Gas Burner, per doz. @ \$1.15
@ \$1.30; 6 in., \$1.45 @ \$1.50.
Gas Pipe 7 8 19 12-in.
\$2.00 \$2.25 \$2.75 \$3.50
Acme Nippers 50¢/5¢
Cronk & Carrier Mfg. Co.:
American Button 80¢
Improved Button 75¢/10¢
Cronk's 60¢
Stub's Pattern 50¢
Combination and others 33¢/4¢
Heller's Farriers' Nippers, Pincers
and Tools 40¢/50¢/10¢/5¢
The Nettleton Mfg. Co. Reversible
Cutting Nippers 40¢
P. S. & W. Tinnors' Cutting Nip-
pers 60¢
Wm. Schollhorn Co.:
Bernard, 33 1/2%; Elm City, 33 1/2%;
Paragon, 50%; Lodi, 50%.
Swedish Side, End and Diagonal Cut-
ting Pliers 50¢
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40¢

Plumbs and Levels—
Chapin-Stephens Co.:
Plumbs and Levels 30¢/30¢/10¢
Chapin's Imp. Brass Cor. 40¢/40¢/10¢
Pocket Levels 30¢/30¢/10¢
Extension Sights 30¢/30¢/10¢
Machinist's Levels 40¢/40¢/10¢
Dixon's Plumbs and Levels 60¢/10¢
Dixon's Pocket Levels 60¢/10¢
C. E. Jennings & Co.'s Iron, Adjust-
able 40¢/7¢/4¢
Stanley R. & L. Co. 40¢
Stanley's Duplex 30¢
Woods' Extension 33¢/4¢

Poachers, Egg—
Buffalo Steam Egg Poachers, 50 doz.
No. 1, \$6.00; No. 2, \$7.00; No. 3,
\$9.00; No. 4, \$12.00 50¢

Points, Glaziers—
Bulk and 1-lb. papers, 10¢/10¢
1/4-lb. papers 10¢/10¢/4¢
1/2-lb. papers 10¢/10¢/11¢

Pokes, Animal—
Ft. Madison Hawkeye 50 doz. \$3.25
Ft. Madison Western 50 doz. \$4.00

Police Goods—
Manufacturers' Lists 25¢/25¢/5¢
Tower's 25¢

Polish—Metal, Etc—
Glasbrite, No. 2, 5 lb can (powder),
each, \$1.25; 50 doz., \$12.00; No. 2, 10 lb
can (cake), each, \$2.50; 50 doz., \$25.00.
Prestoline Liquid, No. 1 (1/2 pt.), 50
doz., \$3.00; No. 2 (1 qt.), \$9.00. 40¢
Prestoline Paste 40¢
George William Hoffman:
U. S. Metal Polish Paste, 3 oz.
boxes, 50 doz. \$5.00; 50 doz. \$4.50;
1/4 lb boxes, 50 doz. \$1.25; 1 lb
boxes, 50 doz. \$2.25.
U. S. Liquid, 8 oz cans, 50 doz.,
\$1.25.
Barkeepers' Friend Metal Polish, 50
doz., \$1.75.

Stove—
Black Eagle Benzine Paste, 5 lb cans,
50 doz. \$10.00
Black Eagle, Liquid, 1/4 pt. cans,
50 doz. \$7.50
Black Jack Paste, 1/4 lb cans, 50 doz. \$9.00
Black Kid Paste, 5 lb cans, each, \$0.65
Ladd's Black Beauty Liquid, per
100 tins \$4.75
Joseph Dixon's, 50 gr. \$5.75 10¢
Dixon's Plumbago 10¢/8¢
Firestone 10¢/8¢
German, 50 gr. \$4.50 10¢
Japanese, 50 gr. \$3.50 10¢
Jet Black 10¢/8¢
Peerless Iron Enamel, 10 oz cans,
50 doz. \$1.50

Wynn's Black Silk:
Paste, cans, 50 doz., 5 oz., \$0.75;
1/2 lb, \$1.00; 1 lb can, each, \$0.75
Paste, 5 lb can, each, \$0.70
Liquid, cans, 50 doz., 6 oz., \$0.75;
1/4 pt., \$1.00; 1 pt., \$1.75
Steel Range Enamel, 50 doz., 1/4 pt.,
\$1.00; 1/2 pt., \$1.25.

Poppers, Corn—
1 qt. Square, doz. \$0.80; gro. \$8.00
1 qt. Round, doz. \$0.90; gro. \$9.00
1 1/2 qt. Square, doz. \$1.00; gro. \$10.00
1 1/2 qt. Round, doz. \$1.20; gro. \$12.00

**Post Hole and Tree Aug-
ers and Diggers—**
See also Diggers, Post Hole, &c.

Posts, Steel—
Steel Fence Posts, each, 5 ft., 4 1/2";
6 ft., 4 1/2"; 8 ft., 4 1/2".
Steel Hitching Posts each \$1.30

Potato Parers—
See Parers, Potato.

Pots, Glue—
Enamelled 35¢/10¢
Tinned 30¢/10¢

Powder—
In Canisters:
Duck, 1 lb each 45¢
Fine Sporting, 1 lb each 75¢
Rifle, 1/2 lb each 15¢
Rifle, 1 lb each 25¢
In Kegs:
12 1/2-lb. kegs \$3.50
25-lb. kegs \$4.50
King's Semi-Smokeless:
(25 lb bulk) \$6.50
Half Keg (12 1/2 lb bulk) \$3.50
Quarter Keg (6 1/4 lb bulk) \$1.90
Case 24 (1 lb cans bulk) \$8.50
Half case (1 lb cans bulk) \$4.50
King's Smokeless: Shot Gun, Rifle.
Keg (25 lb bulk) \$12.00 \$15.00
Half Keg (12 1/2 lb bulk) 6.25 7.75
Quarter Keg (6 1/4 lb bulk) 3.25 4.00
Case 21 (1 lb cans bulk) 14.00 17.00
Half case 12 (1 lb c. bk.) 7.25 8.75
Robin Hood Smokeless Shot Gun, 50¢/20¢

Presses—
Fruit and Jelly—
Enterprise Mfg. Co. 20¢/25¢
Seal Presses—
Morrill's No. 1, 50 doz., \$30.00 50¢

Pruning Hooks and Shears
See Shears.

Pullers, Nail—
Cyclops 50¢
Miller's Falls, No. 3, 50 doz., \$12.00 50¢
Morrill's No. 1, Nail Puller, 50 doz.
\$20.00 50¢
Pearson, No. 1, Cyclone Spike Puller,
each \$30.00 50¢
Scranton, Case Lots 50¢
No. 2B (large) \$5.50
No. 3B (small) \$5.00
Smith & Hemenway Co.:
Diamond B, case lots, 50 doz., Large,
\$9.00; Small, \$7.50.
Giant No. 1, 50 doz., \$18; No. 1 1/2,
\$16.50; No. 3, \$15 33¢/4¢
Staple Pullers, Utica and Davi-
son 60¢
Parrot Tack and Stub Puller, 50 doz.,
75¢; 50 gro., \$6.00

Pulleys, Single Wheel—
Inch 1/4 1/2 3 4
Avening or Tackle,
doz. \$0.30 .45 .60 1.05
Hay Fork, Sichel or Solid Eye,
doz., 4 in., \$1.25; 5 in., \$1.55
Inch 2 1/4 2 1/2 3 1/2
Hot House, doz. \$0.65 .85 1.80
Inch 1/4 1/2 3/4 1 1/2
Screw, doz. \$0.16 .19 .23 .30
Inch 1/4 1/2 3/4 1 1/2
Side, doz. \$0.25 .40 .55 .60
Inch 1/4 1/2 3/4 1 1/2
Stowell's:
Ceiling or End, Anti-Friction, 60¢/10¢
Dumb Waiter, Anti-Friction, 60¢/10¢
Electric Light 60¢
Side, Anti-Friction 60¢/12¢

Sash Pulleys—
Common Frame: Square or
Round End, per doz, 1 1/2" and
2 in. 16¢/19¢
Auger Mortise, no Face Plate,
per doz, 1 1/2" and 2 in. 16¢/19¢
Acme, No. 35, 1 1/2 in., 18¢/4¢; 2 in., 20¢/4¢
Box-All-Steel, Nos. 3 and 4, 2 in. 50¢

Grand Rapids All Steel Noiseless, 50%
Ideal 70¢/5¢
Niagara, No. 25, 1 1/4 in., 18 1/4¢; 2
in. 20 1/2¢
No. 26, Troy, 1 1/4 in., 14 1/4¢; 2 in., 16 1/4¢
Star, No. 26, 1 1/4 in., 18 1/4¢; 2 in., 20 1/2¢
Tackle Blocks—See Blocks.

Pumps—
Claster 60¢
Pitcher Spout 75¢/45¢/75¢/10¢
Wood Pumps, Tubing, &c. 45¢/15¢
Barnes Dbl. Acting (low list) 40¢/10¢
Barnes Pitcher Spout 75¢/10¢
Contractors' Rubber Diaphragm No.
2, B. & L. Block Co. \$16.00
Daisy Spray Pump 50 doz. \$6.50
Flint & Walling's Fast Mail Hand
(low list) 55¢
Flint & Walling's Fast Mail (low
list) 55¢
Flint & Walling's Tight Top Pitcher
..... 75¢/10¢/5¢
National Specialty Mfg. Co. Measur-
ing Nos. 2, \$6.00; 3, \$5.50 30¢
Myer's Pumps (low list) 40¢/10¢
Myer's Power Pumps 40¢/10¢
Myer's Spray Pumps 40¢/10¢

Pump Leathers—
Plunger and Lower Valve—Per
gro.:
Inch 2 1/4 2 1/2 2 3/4 3
\$2.80 2.50 2.75 3.00
Inch 3 3 1/4 3 1/2 3 3/4
\$3.50 3.60 3.85 4.10 4.40
Plunger Cup Leathers—Per 100:
Inch 2 1/4 3 3 1/4 3 3/4
\$2.75 3.85 3.00 6.00

Punches—
Saddlers' or Drive, good doz. 50¢/75¢
Spring, single tube, good qual-
ity \$1.75/\$2.00
Revolving (4 tubes) doz. \$3.50/\$3.75
Bemis & Call Co.'s Cast St'l Drive, 50%
Morrill's Nos. 1A, 1A, 1B, 1C,
1D, 1E, 1F, 1G, 1H, 1I, 1J, 1K,
1L, 1M, 1N, 1O, 1P, 1Q, 1R, 1S,
1T, 1U, 1V, 1W, 1X, 1Y, 1Z, 1AA, 1AB,
1AC, 1AD, 1AE, 1AF, 1AG, 1AH, 1AI,
1AJ, 1AK, 1AL, 1AM, 1AN, 1AO, 1AP,
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1BBBO, 1BBBP, 1BBBQ, 1BBBR, 1BBBS,
1BBBT, 1BBBU, 1BBBV, 1BBBW, 1BBBX,
1BBBY, 1BBBZ, 1BBBA, 1BBBB, 1BBBC,
1BBBD, 1BBBE, 1BBBF, 1BBBG, 1BBBH,
1BBBI, 1BBBJ, 1BBBK, 1BBBL, 1BBBM,
1BBBN, 1BBBO, 1BBBP, 1BBBQ, 1BBBR,
1BBBS, 1BBBT, 1BBBU, 1BBBV, 1BBBW,
1BBBX, 1BBBY, 1BBBZ, 1BBBA, 1BBBB,
1BBBC, 1BBBD, 1BBBE, 1BBBF, 1BBBG,
1BBBH, 1BBBI, 1BBBJ, 1BBBK, 1BBBL,
1BBBM, 1BBBN, 1BBBO, 1BBBP, 1BBBQ,
1BBBR, 1BBBS, 1BBBT, 1BBBU, 1BBBV,
1BBBW, 1BBBX, 1BBBY, 1BBBZ, 1BBBA,
1BBBB, 1BBBC, 1BBBD, 1BBBE, 1BBBF,
1BBBG, 1BBBH, 1BBBI, 1BBBJ, 1BBBK,
1BBBL, 1BBBM, 1BBBN, 1BBBO, 1BBBP,
1BBBQ, 1BBBR, 1BBBS, 1BBBT, 1BBBU,
1BBBV, 1BBBW, 1BBBX, 1BBBY, 1BBBZ,
1BBBA, 1BBBB, 1BBBC, 1BBBD, 1BBBE,
1BBBF, 1BBBG, 1BBBH, 1BBBI, 1BBBJ,
1BBBK, 1BBBL, 1BBBM, 1BBBN, 1BBBO,
1BBBP,

Keuffel & Esser Co.:	
Folding, Wood.....	35@10%
Folding, Steel.....	33@10%
Lufkin's Steel.....	50@10%
Lufkin's Lumber.....	60%
Stanley R. & L. Co.:	
Boxwood.....	60%
Ivory.....	60%
Miscellaneous.....	40%
Zig Zag.....	40%
Zig Zag, Pin Joint.....	42@%
Upson Nut Co.:	
Boxwood.....	60@60@10%
Ivory.....	35@10@35@10@10%

Sash Balances—

See Balance, Sash.

Sash Locks—

See Locks, Sash.

Sash Weights—

See Weights, Sash.

Sausage Stuffers or Fillers

See Stuffers or Fillers, Sausage.

Saw Frames—

See Frames, Saw.

Saw Sets—See Sets, Saw.**Saw Tools—See Tools, Saw.****Saws—**

Atkins:

Circular.....45%

Band.....50@50@10%

Butcher Saws.....50%

Cross Cuts.....35%

One-Man Cross Cut.....40%

Narrow Cross Cut.....50%

Hand, Rip and Panel.....35@%

Miter Box and Compass.....40%

Mulay, Mill and Drag.....45%

Chapin-Stephens Co.:

Turning Saws and Frames.....30@30@10%

Diamond Saw & Stamping Works:

Sterling Kitchen Saws.....30@10@10%

Diston's:

Circular, Solid and Ins'ted Tooth.....50%

Band, 2 to 18 in. wide.....60%

Band, 4 to 14.....60%

Crosscuts.....45%

Narrow Crosscuts.....50%

Mulay, Mill and Drag.....50%

Framed Woodsaws.....25%

Woodsaw Blades.....15%

Woodsaw Rods.....15%

Hand Saws, Nos. 12, 9, 8, 16, 1100.....25%

10, 12, 7, 17, 8.....25%

Hand Saws, Nos. 7, 107, 107 1/2, 3, 1, 0, 0, Combination.....30%

Compass, Key Hole, &c.....25%

Butcher Saws and Blades.....30%

C. E. Jennings & Co.:

Butcher Saws.....25%

Compass and Key Hole Saws.....35@%

Framed Wood Saws.....30%

Hand Saws.....20@2%

Wood Saw Blades.....30%

Millers Falls:

Butcher Saws.....15@10%

Star Saw Blades.....15@10%

Massachusetts Saw Works:

Victor Kitchen Saws.....40@10@50%

Butcher Saws Blades.....35@40%

Peace & Richardson's Hand Saws.....30%

Simonds:

Circular Saws.....45%

Crescent Ground Cross Cut Saws.....30%

One-Man Cross Cuts.....40@10%

Gang Mill, Mulay and Drag Saws.....45%

Band Saws.....50%

Back Saws.....25@25@10%

Butcher Saws.....25@25@10%

Hand Saws.....25@25@10%

Hand Saws, Bay State Brand.....45%

Compass, Key Hole, &c.....25@25@10%

Wood Saws.....40@4%

Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws.....50%

Hack Saw Blades and Frames—

Atkins' Hack Saw Blades A & A.....25%

Diston's:

Concave Blades.....25%

Keystone Blades.....35%

Hack Saw Frames.....30%

Simonds File Co.:

C. E. Jennings & Co.:

Hack Saw Frames, Nos. 175, 180.....40@10%

Hack Saws, Nos. 175, 180, complete.....40@10%

Goodell's Hack Saw Blades.....40@10%

Griffin's Hack Saw Frames.....35@5@10%

Griffin's Hack Saw Blades.....35@5@10%

Star Hack Saws and Blades.....15@10%

Sterling Hack Saw Blades.....30@10@50%

Sterling Hack Saw Frames.....30@10@10%

Sterling Power Hack Saw Machines, each, No. 1, \$25.00; No. 2, \$30.00.....10%

Victor Hack Saw Blades.....25%

Victor Hack Saw Frames.....40%

Scroll—

Barnes, No. 7, \$15.....25%

Barnes' Scroll Saw Blades.....25%

Barnes' Velocipede Power Scroll Saw, without boring attachment, \$15; with boring attachment, \$20.....20%

Lester, complete, \$15.00.....15@10%

Rogers, complete, \$3.50 and \$4.00.....15@10%

Scales—

Family, Turnbull's.....50@60@10%

Counter:

Hatch, Platform, 1/4 oz. to 4 lbs.....dos. \$5.50

Two Platforms, 1/4 oz. to 8 lbs.....dos. \$10.00

Union Platform, Plain.....\$1.70@1.90

Union Platform, Std.....\$1.85@1.15

Chaffin's:

Eureka.....25%

Favorite.....40%

Crocker's Trip Scales.....50%

Chicago Scale Co.:

The Little Detective.....25 lb. 50%

Union or Family No. 2.....50%

Portable Platform (reduced list).....50%

Wagon or Stock (reduced list).....25@35%

The Standard Portables.....45%

The Standard R. R. and Wagon.....50@10%

Scrapers—

No. 1 Handle.....dos. \$2.00@2.25

No. 2 Handle.....dos. \$2.50@2.60

Light, \$2.00; Heavy, \$4.00

Adjustable Box Scraper (S. B. & L. Co.)

No. 1, \$6.00.....45%

Chapin-Stephens Co., Box.....30@30@10%

Screws—Bench and Hand

Bench, Iron, doz., 1 in., \$2.50@

2 1/2, 1 1/2, \$3.00@3.25; 1 1/4, \$3.50@3.75

Bench, Wood.....20@20@10%

Hand, Wood.....20@20@10%

R. Bliss Mfg. Co., Hand.....20@20@10%

Chapin-Stephens Co., Hand.....20%

Coach, Lag and Hand Rail—

Lag, Cone Point, list Oct. 1, '99.....75@15%

Coach, Gimlet Point, list Oct. 1, '99.....75@10%

Hand Rail, list Jan. 1, '01.....70@10@75%

Jack Screws—

Standard List.....75%

Millers Falls.....50@10@10%

P. S. & W.....50%

Sweet Iron Works.....75@80%

Machine—

List Jan. 1, '98:

Flat or Round Head, Iron.....50@50@10%

Flat or Round Head, Brass.....50@50@10%

Set and Cap—

Set (Iron).....75@10@75%

Set (Steel), net advance over Iron.....25%

Sq. Hd. Cap.....70@10@75%

Hex. Hd. Cap.....70@10@75%

Rd. Hd. Cap.....50@75%

Fillister Hd. Cap.....60@75%

Wood—

List July 23, 1903:

Flat Head, Iron.....87@45@%

Round Head, Iron.....85@50@%

Flat Head, Brass.....82@45@%

Round Head, Brass.....80@50@%

Flat Head, Bronze.....77@45@%

Round Head, Bronze.....75@50@%

Drive Screws.....87@45@%

Scroll Saws—

See Saws, Scroll.

Scythes—

Grass, No. 1, Plain.....\$6.25@6.75

Clipper, Bronzed Webb.....\$6.50@7.00

No. 3 Clipper, Pol'd Webb.....\$6.75@7.25

No. 6 Clipper and Solid Steel.....\$7.00@7.50

Bush, Weed and Bramble, No. 2.....\$6.50@7.00

Grain, No. 1.....\$8.25@8.75

Bronzed Webb, No. 1.....\$8.50@9.00

Nos. 3 and 4 Clipper, Grain.....\$8.75@9.25

Solid Steel, No. 6.....\$9.25@9.75

Seeders, Raisin—

Enterprise.....25@30%

Sets—

Fray's Adj. Tool Handles, Nos. 1, \$12; 2, \$12; 3, \$12; 4, \$9; 5, \$7.....30%

C. E. Jennings & Co.'s Model Tool Holders.....30%

Millers Falls Adj. Tool Handles, No. 1, \$12; No. 4, \$12; No. 5, \$18.....15@10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel.....\$9 doz sets \$9.00

Sets, Nail—

Octagon.....gro. \$3.50@3.75

Huck Bros.....30%

Cannon's Diamond Point.....\$9 doz sets \$12.00

Mayhew's.....\$9 doz sets \$9.00

Snell's Corrugated, Cup Pt.....40@10%

Snell's Knurled, Cup Pt.....40@10%

Victor Knurled, Cup Pt.....\$9 doz sets \$7.50

Rivet—

Regular list.....75@75@10%

Saw—

Atkins:

Criterion.....40%

Adjustable.....40%

Diston's Star, Monarch and Triumph.....30%

Morrill's No. 1.....\$15.00

Nos. 3 and 4, Cross Cut.....\$30.00

No. 5, Mill.....\$30.00

Nos. 10, 11, 95.....\$15.00

No. 1 Old Style.....\$10.00

Special.....\$16.25

Giant Royal Cross Cut.....\$20.00

Royal, Hand.....\$20.00

Taintor Positive.....\$20.00

Shaving—

Fox Shaving Sets, No. 30.....\$24.00

Smith & Hemenway Co.'s.....60%

Sharpeners, Knife—

Chicago Wheel & Mfg. Co.....70%

Pike Mfg. Co.:

Fast Cut Pocket Knife Hones.....\$1.50

Mounted Kitchen Sand Stone.....\$1.50

Natural Grit Carving Knife.....\$3.00

Quick Cut Emery Carving Knife Hones.....\$1.50

Quick Edge Pocket Knife.....\$2.00

Hones.....\$2.00

Skate—

Smith & Hemenway Co., Eureka.....20%

Shaves, Spoke—

Iron.....dos. \$1.10@1.25

Wood.....dos. \$1.75@2.25

Bailey's (Stanley R. & L. Co.).....45%

Razor Edge (Stanley R. & L. Co.).....55%

Iron, 50% Wood.....55%

Chapin-Stephens Co.....30@30@10%

Goodell's.....\$9 doz. \$9.00

Wood's F1 and F2.....50%

Shears—

Cast Iron.....7 8 9 10

Best.....\$16.00 18.00 20.00 gro.

Good.....\$13.00 15.00 17.00 gro.

Cheap.....\$5.00 6.00 7.00 gro.

Straight Trimmers, &c.:

Best quality Jap.....70@70@10%

Best quality Nickel.....60@60@10%

Fair quality, Jap.....80@80@10%

Fair quality, Nickel.....75@75@10%

Tailors' Shears.....40@40@10%

Acme Cast Shears.....40@40@5%

Heinrich's Tailor's Shears.....40@40@5%

Wilkinson Shear & Cutlery Co.:

Sheep, 1900 list.....30@10@5%

Grass.....50@10%

Horse or Mule.....50@10%

Tinners' Snips—

Steel Blades.....20@45@20@10%

Steel Laid Blades.....40@10@50%

Forged Handles, Steel Blades, Berlin.....50%

Heinrich's Snips.....40%

Jennings & Griffin Mfg. Co.'s, 6 1/2 to 10 in.....50%

Niagara Snips.....40%

P. S. & W. Forged Handles.....20%

Pruning Shears—

Cronk's Hand Shears.....33 1/4%

Cronk's Wood Handle Shears.....33 1/4%

Diston's Combined Pruning Hook and Saw, # doz. \$18.00.....25%

Diston's Pruning Hook only, # doz. \$12.00.....25%

John T. Henry Mfg. Co.:

Pruning Shears, all grades.....40%

P. S. & W. Co.....30%

Wilkinson Shear & Cutlery Co.:

Hedge, Wilcut Brand.....60@10%

Lawn and Border, Wilcut Brand.....60@10%

Sheaves—Sliding Door—

Stowell's Anti-Friction.....50%

Reading.....40%

R. & E. list.....15%

Wrightsville Hatfield Pattern.....87 1/2%

Sliding Shutter—

Reading list.....40%

R. & E. list.....10%

Shells—Shells, Empty—

Brass Shells, Empty:

Climax, 10 and 12 gauge.....65@10%

Club, Rival, 65@5%; First Quality.....60@5%

Paper Shells, Empty:

New Rapid, 10, 12, 16 and 20 gauge.....25@10%

Climax, 10 and 12 gauge: Acme, 10, 12, 16 and 20 gauge: Ideal, 10, 12, 16 and 20 gauge: Leader grade.....25@5%

Union, League, 12 and 12 gauge: Rival grade.....25%

New Climax, Defiance, 10, 12, 14, 16 and 20 gauge: Climax, 14, 16 and 20 gauge.....20@5%

Challenge, Monarch, 10, 12, 16 and 20 gauge: League, Union, 14, 16 and 20 gauge: Repeater Grade.....20%

Expert, 10, 12, 16 and 20 gauge.....33 1/4@5%

Robin Hood, Low Brass.....20@5%

Robin Hood, High Brass.....30@5%

Soyine Stones		
Chicago Wheel & Mfg. Co.:		
Gem, 10 gro. 10 in. \$5.00; 12 in. \$10.80.		
Norton Alundum Soyine Stones:		
Less than 10 gross lots.....	\$6.00	
Lots of 10 gross or more.....	\$4.50	
Pike Mfg. Co., 1901 list:		
Black Diamond S. S. 1/2 gro. \$12.00		
Lamotte S. S. 1/2 gro. \$11.50		
White Mountain S. S. 1/2 gro. \$9.00		
Green Mountain S. S. 1/2 gro. \$6.00		
Extra Indian Pond S. S. 1/2 gro. \$7.50		
No. 1 Indian Pond S. S. 1/2 gro. \$7.00		
No. 2 Indian Pond S. S. 1/2 gro. \$4.50		
Leader Red End S. S. 1/2 gro. \$4.50		
Quick Cut Emery.....	\$10.00	
Pure Corundum.....	\$18.00	
Crescent.....	\$7.00	
Emery Soyine Rifles, 2 Coat. \$8		
Emery Soyine Rifles, 3 Coat. \$10		
Emery Soyine Rifles, 4 Coat. \$12		
Balance of 1904 list 33 1/2%		
Stoppers, Bottle—		
Victor Bottle Stoppers.....	\$9.00	
Stops—Bench—		
Millers Falls.....	15@10%	
Morrill's, No. 1, 10 in.	30%	
Morrill's, No. 2, 12 in.	50%	
Door—		
Chapin-Stephens Co.....	10@60@10%	
Plane—		
Chapin-Stephens Co.....	20%	
Straps—Box		
Cary's Universal, case lots.....	20@10@10%	
Stretchers, Carpet		
Cast Iron, Steel Points, doz.	60@60@10%	
Socket.....	dos. \$1.00	
Bullard, 1/2 doz.....	\$1.00	
Excelsior Stretcher and Tack Hammer Combined, 1/2 doz.....	20%	
Woven Fence—		
Franklin.....	ca. \$3.75	
Strops, Razor—		
Star Diagonal Strop.....	25%	
Stuffers, Sausage—		
Enterprise Mfg. Co.....	2@25@7 1/2%	
National Specialty Co., list Jan. 1, 1902.....	30@5%	
Sweepers, Carpet—		
National Sweeper Co.:		
Louis XV, Roller Bearing, Gold Plated.....	\$120.00	
Hepplewhite, Roller Bearing, Silver Plated.....	\$120.00	
Sheraton, Roller Bearing, N'kel \$40.00		
Ye Mission, Roller Bearing, Oxidized Copper.....	\$30.00	
Transparent, Roller Bearing, Plate Glass top, Nickel.....	\$30.00	
National Queen, Roller Bearing, Fancy Veneers.....	\$4.00	
Loyal, Roller Bearing, Nickel.....	\$25.00	
Triple Medal, Roller Bearing, Nickel.....	\$24.00	
Marion, Roller Bearing, N'kel \$24.00		
Marion Queen, Roller Bearing, Nickel.....	\$21.00	
Monarch, Roller Bearing, N'kel \$22.00		
Monarch, Roller Bearing, Jap. \$23.00		
Perpetual, Regular B'ra, Jap. \$18.00		
Monarch Extra (17 in. case), Roller Bearing, Nickel.....	\$36.00	
Monarch Extra (17 in. case), Roller Bearing, Japanned.....	\$33.00	
Auditorium (26 in. case), Roller Bearing, Nickel.....	\$54.00	
Mammoth (30 in. case), Roller Bearing, Nickel.....	\$50.00	
NOTE—Rebates: 50c per dozen on three dozen lots; \$1 per dozen on five dozen lots; \$2 per dozen on ten dozen lots; \$2.50 per dozen on twenty-five dozen lots.		
Streator Metal Stamping Co.:		
Eureka Japanned.....	1/2 doz. \$15.00	
Model E, Sanitaire.....	1/2 doz. \$25.00	
Model A, Sterling.....	1/2 doz. \$25.00	
Model B, Sterling, Nickel.....	1/2 doz. \$25.00	
Model B, Sterling, Japanned.....	1/2 doz. \$25.00	
Model C, Sterling.....	1/2 doz. \$21.50	
Model D, Sterling.....	1/2 doz. \$19.50	
Tacks, Finishing Nails, &c.		
New List, May 1, 1905.		
American Carpet Tacks.....	90@30%	
American Cut Tacks.....	90@30%	
Sweedes Cut Tacks.....	90@30%	
Sweedes Upholsterers'.....	90@40%	
Gimp Tacks.....	90@40%	
Lace Tacks.....	90@40%	
Trimmers' Tacks.....	90@30%	
Looking Glass Tacks.....	65%	
Bill Posters' and Railroad Tacks.....	90@40%	
Hungarian Nails.....	80@10%	
Finishing Nails.....	70%	
Trunk and Clout Nails.....	80%	
NOTE—The above prices are for Standard Weights. An extra 5% is given on Medium Weights, and an extra 10% is given on light weight.		
Miscellaneous—		
Double Pointed Tacks.....	90@40%	
See also Nails, Wire.		
Tanks, Oil and Gasoline—		
R. M. Co.:		
Gal. Emerald.....	Oil	
30.....	\$3.10	Queen City
60.....	\$4.25	\$4.50
Wilson & Friend Co.:		
Gal. Gasoline.....	Oil	
30.....	\$2.75	\$3.00
60.....	\$3.50	\$3.75
110.....	\$5.00	\$5.75
Tapes, Measuring—		
American Asses' Skin.....	59@—	
Patent Leather.....	25@30@45%	
Steel.....	33 1/2@45%	
Chesterman's.....	25@25@45%	
Keuffel & Esser Co.:		
Favorite, Ass Skin.....	40@10@50%	
Favorite, Duck and Leather.....	25@50@35@10%	

Metallic and Steel, lower list, 35@35 1/2%; Pocket, 35@35 1/2%.	
Lutkin's:	
Asses' Skin.....	10@10@50%
Metallic.....	30@30@45%
Patent Bend Leather.....	25@50@10%
Pocket.....	10@40@45%
Steel.....	33 1/2@35%
Wiebusch & Hilger:	
Chesterman's Metallic, No. 34L.....	25%
etc.....	25%
Chesterman's Steel, No. 1038L.....	35%
etc.....	35%
Teeth, Harrow—	
Steel Harrow Teeth, plain or headed, 1/2-inch and larger.....	
per 100 lbs. \$2.75@3.00	
Thermometers—	
Tin Case.....	
80@10@80@10@45%	
Ties, Bale—Steel Wire—	
Single Loop.....	
80@84%	
Monitor, Cross Head, etc. 60@10@65%	
Crack Ties—	
Niagara Brick Ties.....	
5@10%	
Tinners' Shears, &c.—	
See Shears, Tinners', &c.	
Tinware—	
Stamped, Japanned and Pieced, sold very generally at net prices.	
Tire Benders, Upsetters, &c.	
See Benders and Upsetters, Tire.	
Tools—Coopers'—	
L. & I. J. White.....	
20@20@45%	
Hay—	
Myers' Hay Tools.....	
50%	
Stowell's Hay Carriers, 50%; Hay Forks, 50%; Fork Pulleys, 60%.	
Miniature—	
Smith & Hemenway Co.'s, Davidson.....	
25%	
Saw—	
Atkins' Cross Cut Saw Tools.....	
35@45%	
Simonds' Improved.....	
30@2%	
Simonds' Crescent.....	
25%	
Ship—	
L. & I. J. White.....	
25%	
Transom Lifters—	
See Lifters, Transom.	
Traps—Fly—	
Bailoon, Globe or Acme, doz.	
\$1.15@1.25; gro. \$11.50@12.00	
Harper, Champion or Paragon, doz. \$1.25@1.40; gro. \$13.00@13.50	
Game—	
Imitation Onocda.....	
70@10%	
Newhouse.....	
40@40%	
Hawley & Norton.....	
65%	
Victor.....	
70@10%	
Onocda Community Jump.....	
50%	
Mouse and Rat—	
Mouse, Wood, Choker, doz. holes.....	
12c	
Mouse, Round or Square Wire.....	
doz. \$5.00@6	
Marty French Rat and Mouse Traps (Genuine):	
No. 1, Rat, 1/2 doz., \$13.25; case of 24.....	
\$11.50 doz.	
No. 3, Rat, 1/2 doz., \$6.50; case of 50.....	
\$5.75 doz.	
No. 3 1/2, Rat, 1/2 doz., \$5.25; case of 72.....	
\$4.70 doz.	
No. 4, Mouse, 1/2 doz., \$3.55; case of 150.....	
\$3.00 doz.	
No. 5, Mouse, 1/2 doz., \$3.00; case of 150.....	
\$2.50 doz.	
Trimmers, Spoke—	
Wood's E. I.....	
50%	
Trowels—	
Diston Brick and Pointing.....	
25%	
Diston Plastering.....	
20%	
Diston "Standard Brand" and Garden Trowels.....	
30%	
Kohler's Steel Garden Trowels, 1/2 gro., 5 in., \$1.80; 6 in., \$6.00.	
Never-Break Steel Garden Trowels.....	
1/2 gro. \$6.00	
Rose Brick and Plastering.....	
25@5%	
Woodrough & McParlin, Plastering.....	
25%	
Trucks, Warehouse, &c.—	
B. & L. Block Co.:	
New York Pattern.....	
50@10%	
Western Pattern.....	
60@10%	
Handy Trucks.....	
1/2 doz. \$16.00	
Grocery.....	
1/2 doz. \$15.00	
Daisy Store Trucks, Improved Pattern.....	
1/2 doz. \$18.50	
McKinney Trucks.....	
each \$10.00	
Model Store Trucks.....	
1/2 doz. \$18.50	
Tubs, Wash—	
M'Pur's list, price per gross.	
No. 0 1 2 3	
Galvanized, \$64 \$76 \$84 \$96 104 112	
Galvanized Wash Tubs (R. M. Co.):	
No. 1 2 3 4 5 6 7 8 9 10	
Per doz., net. \$5.75 6.30 7.20 8.00 9.00 10.00 11.00 12.00 13.00 14.00	
Twine, Miscellaneous—	
Flax Twine:	
No. 9, 1/4 and 1/2 lb. Balls. 23@25c	
No. 12, 1/4 and 1/2 lb. Balls. 21@22c	
No. 18, 1/4 and 1/2 lb. Balls. 19@20c	
No. 24, 1/4 and 1/2 lb. Balls. 17@19c	
No. 36, 1/4 and 1/2 lb. Balls. 16@18c	
Chalk Line, Cotton.....	
26@31c	
Cotton Mops, 6, 9, 12 and 15 lb. to doz.....	
11@12c	
Cotton Wrapping, 5 Balls to lb., according to quality.....	
15@12c	
American 2-Ply Hemp, 1/4 and 1/2 lb. Balls.....	
14@15c	
American 3-Ply Hemp, 1-lb. Balls.....	
15@16c	
India 2-Ply Hemp, 1/4 and 1/2 lb. Balls (Spring Twine).....	
10@11c	
India 3-Ply Hemp, 1-lb. Balls.....	
10@11c	
India 3-Ply Hemp, 1 1/2 lb. Ball.....	
10@11c	
2, 3, 4 and 5-Ply Jute.....	
12@13c	
Balls.....	
12@13c	
Mason Line, Linen, 1/2 lb. Bls. 17c	
No. 26 Mattress, 1/4 and 1/2 lb. Balls, according to quality.....	
30@60c	
Wool, 3 to 6 ply.....	
B 9c; A 10c	

Vises—	
Solid Box.....	
50@10%	
Parallel—	
Athol Machine Co.:	
Simpson's Adjustable.....	
40%	
Standard.....	
40%	
Amateur.....	
25%	
Columbian Hdw. Co.....	
40%	
Emmert Universal:	
Pattern Makers' No. 1, \$15.00; No. 2, \$12.50.	
Machinist and Tool Makers' No. 4A, \$12.50; No. 6A, \$10.00; No. 10A, \$22.50.	
Presto Quick Acting, Adjustable Jaw, 25@25@10%; Solid Jaw.....	
35@35@10%	
Tizer Machinists'.....	
42%	
Fisher & Norris Double Screw, net, each, Nos. 2, \$10.50; 3, \$16.00; 4, \$20.50; 5, \$27.00.	
Fulton Mach. & Vise Co.:	
Reed, Swivel.....	
25%	
Star, Solid Jaw.....	
40%	
Holland's.....	
100@45%	
Keystone.....	
65@70%	
Lewis Tool Co.:	
Adjustable Jaw.....	
30%	
Monarch, 50%; Solid Jaw.....	
50%	
Massey Vise Co.:	
Climber.....	
40%	
Perfect, 15%; Lightning Grip.....	
15%	
Merrill's.....	
20%	
Millers Falls Oval Slide Pattern.....	
60@10%	
Parker's:	
Victor, 20@25%; Regulars.....	
20@25%	
Vulcan's.....	
40@45%	
Combination Pipe.....	
55@60%	
Prentiss.....	
20@25%	
Snediker's.....	
33%	
Stephens'.....	
33%	
Saw Filers—	
Diston's D 3 Clamp and Guide, 1/2 doz., \$24.00, 30%; Clamps.....	

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